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ABSTRACT

These four serials address issues of concern for child development researchers and specialists and also address the implications for policies affecting children. The first issue reports on "Latin American Immigration and U.S. Schools." The report provides an overview of Latin American immigration, its impact on schools, and efforts to improve academic achievement. The second issue reports on "Inclusion of Young Children with Disabilities." The articles examine inclusion of children with disabilities, influences on children with disabilities, definition of inclusion, costs involved, implications for policy, and an update on the "Reauthorization of the Individuals with Disabilities Education Act." The third issue examines "Building Research and Policy Connections: Training and Career Options for Developmental Scientists." The report focuses on the effects of developmental research on public policy, research skills, and career paths. The final issue examines nutrition and its effects on children's biological, psychosocial, and behavioral development, the importance of nutrition in child development, and the role of nutrition in cognitive development and economic progress. Finally, a brief addresses "U.S. Nutrition Programs Under Welfare Reform." (Author/SD)

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SOCIAL POLICY REPORT
Society for Research in Child Development

Volume X, Number 1 1996

Latin American Immigration and U.S. Schools

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
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Nancy G. Thomas

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

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Introduction

Controversy over immigration is as old as immigration itself. Despite our national ideology and the poet's words at the base of the Statue of Liberty ("Give me your tired, your poor . . ."), we are in fact profoundly ambivalent about having in our midst those who look different, speak a different language, and practice different customs. If newcomers are poor and economic times difficult, the mixture becomes especially volatile. Since its founding, the U.S. has experienced waves of foreign immigration, more often than not accompanied by fierce controversy. Most recently, the United States' stated commitment to universal, free, and public education has further complicated matters. Schools, as well as other social agencies and institutions, have become the latest arenas for conflict over immigration policies.

This report has three purposes:

(1) The first section, "Immigration and Its Discontents," provides an overview of the unprecedented Latin American influx of the past two decades and some of the controversy this has created. Interestingly, we can see parallels between what is happening today and what happened a century ago when an earlier immigration influx set off similar reactions. Controversy over current immigration, much of it from Mexico and Central America, is merely the most recent in a long line. One thing that is new, however, is that schools have become a tool in the immigration debate. Those wanting to cut off immigration, particularly illegal immigration, want to deny public school access to undocumented immigrants.

(2) "Latino Immigrants and U.S. Schools" describes some of the impact of the growing Latino population on schools. The number of Hispanic students has soared, but their level of academic achievement overall is low. By far the most controversial aspect of their schooling (aside from whether illegal immigrants should be permitted to attend school) centers on bilingual education. The evidence on bilingual education is mixed, but what is often overlooked is that even when instructed in Spanish, Latino students in U.S. schools still tend to do poorly academically. Whatever we might conclude about the

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benefits of bilingual instruction, these students also need strong academic programs in school. They also need the marshalling of home and family resources to improve their achievement. This section concludes by arguing that Hispanic parents are potentially powerful allies for schools. They hold strong beliefs about the value of formal schooling for children's economic and social mobility and are capable of making substantial contributions to children's school success.

(3) In "A School Change Project" I describe an effort undertaken at an elementary school in Southern California to improve the academic achievement of Latino children of Mexican and Central American origin, who are either immigrants themselves or the children of immigrants. Working in a district that is strongly supportive of bilingual education, but where student achievement still remains low, a collaborative five-year effort involving university researchers and educational practitioners succeeded in substantially improving student achievement schoolwide. The project was based on the assumptions that a strong, academically focused program would improve children's academic achievement and that both educators and parents want much the same thing for students (although they might not always know how to attain it)–high levels of academic attainment. The success of this project suggests lessons for educators facing similar challenges.

Immigration and Its Discontents

"*. . . strange and different foreigners . . .*"

Between 1820 and 1930, nearly 40 million people left their countries of origin and came to the U.S. (Degler, 1970). These great waves of foreign immigration evoked decidedly mixed—if not outright hostile—responses from Americans already here:

> With strange and different foreigners spreading throughout the country, congregating in the cities, . . . pushing their way into farms and factories, it was to be expected that there would be a reaction on the part of the native population. . . . Always it was the numbers of these newcomers which worried the older Americans. (Degler, 1970, pp. 296-297)

The greatest antipathy toward foreigners was reserved for those who came with the least. In the mid–19th century, 90% of all immigration to the U.S. originated from Britain, Ireland, and Germany. While the Germans and British were relatively well off, the Irish were not (North, 1966). It was no accident that the Irish were the most targeted by anti-immigrant nativist groups in Massachusetts (Degler, 1970). The United States was in a depression almost half the years between 1873 and 1900; even during the boom years, few workers could count on full-time work year round (Rosenzweig, Brier, & Brown, 1993).

Of course, the animosity is never simply over economics; strange habits, dress, and language are all unsettling. Referring to anti-immigrant sentiments in Massachusetts, Degler writes:

> Underneath the political manifestations of native anxiety regarding these outlanders was the undeniable fact that the immigrants were different. Their dress was queer, their language was either unknown or wrongly accented, . . . and, perhaps most disturbing of all to the natives, their pleasures, like lager beer gardens and St. Patrick's Day revelries, seemed to be at wide variance with what was considered moral in America. (Degler, 1970, p. 298)

On the West Coast, it was the Chinese who raised people's hackles during a period of terrible economic instability. In 1879 Californians

voted overwhelmingly—154,638 to 883—to stop Chinese laborers from coming to the U.S. (Rosenzweig et al., 1993). The Congress obliged Californians when it passed the Chinese Exclusion Act in 1882. The Act was extended in 1892, and the American Federation of Labor successfully campaigned for a second 10-year extension in 1902, citing "the utter impossibility of our race to compete with the Mongolian":

> Their ability to subsist and thrive under conditions which would mean starvation and suicide to the cheapest laborer of Europe secures to them an advantage which baffles the statesman and economist to overcome, how much less the chances of the laborers pitted in competition against them. (cited in Rosenzweig et al., 1993, "A Clear and Present Danger: The Chinese Exclusion Act," pp. 5–6)

A San Francisco convention seeking to stop Chinese immigration complained, "They work more cheaply than whites; they live more cheaply; they send their money out of the country to China; most of them have no intention of remaining in the United States, and they do not adopt American manners, but live in colonies, and not after the American fashion . . . .":

> Their practical status among us has been that of single men competing at low wages against not only men of our race, but men who have been brought up by our civilization to family life and civic duty. They pay little taxes; they support no institutions, neither school, church, nor theater; they remain steadfastly, after all these years, a permanently foreign element. (cited in Rosenzweig et al., 1993, "Eye on the East: Labor Calls for Ban on Chinese Immigration," p. 5)

Immigration was a volatile issue indeed in the 19th century. Anti-immigrant and nativist sentiments played important roles in the politics and culture of the day. Office-seekers used immigration and the public's fear and distrust of immigrants to their advantage, either out of cynicism or genuine conviction. Rhetoric about preserving the Anglo-Saxon heritage was commonplace (Degler, 1970). Some cast the issue in epochal terms. A 1901 San Francisco convention comprising representatives of county supervisors, city councils, and trade, commercial, and civic organizations around the state—over 1,000 individuals in all—unanimously passed a resolution to the president and congress of the United States urging them to continue excluding Chinese and other undesirable immigrants. In a final section entitled "Our Civilization Is Involved," the assembly came to this thunderous conclusion:

> This is not alone a race, labor, and political question. It is one which involves our civilization and interests the people of the world. The benefactors, scholars, soldiers, and statesmen—the patriots and martyrs of mankind—have builded our modern fabric firmly upon the foundation of religion, law, science, and art. It has been rescued from barbarism and protected against the incursions of barbarians. Civilization in Europe has been frequently attacked and imperiled by the barbaric hordes of Asia. . . . But a peaceful invasion is more dangerous than a war-like attack. We can meet and defend ourselves against an open foe, but an insidious foe under our generous laws would be in possession of the citadel before we were aware. The free immigration of Chinese would be for all purposes an invasion by Asiatic barbarians, against whom civilization in Europe has been frequently defended, fortunately for us. It is our inheritance to keep it pure

> and uncontaminated, as it is our purpose and destiny to broaden and enlarge it. We are trustees for mankind. (cited in Rosenzweig et al., 1993, "Eye on the East: Labor Calls for Ban on Chinese Immigration," pp. 14–15)

Latino Immigration–Legal and Illegal–in the 1980s and 1990s

If much of the preceding has an oddly familiar ring, it should. The U.S. is now in the midst of another heated, difficult, and complex debate about immigration, society, and culture. As before, in the eyes of some the survival of American civilization itself is at stake (see, for instance, Brimelow, 1995, *Alien Nation: Common Sense about America's Immigration Disaster* and the commentary it has sparked [e.g., Hitchens, 1995; Miles, 1995])[1]. Even the Pope has become involved in the debate over the future of immigration to the U.S., a debate that began shaping the 1996 presidential campaign a year ago (Brownstein, 1995; Stammer & Goldman, 1995).

But today it is largely Latino immigrants, rather than the Irish and the Chinese, who stir controversy and evoke fear and animosity. Without question the large and fast-growing Hispanic population in the United States—particularly that portion originating in Mexico and Central America—has helped create a crisis at least as acute as the periodic crises of earlier waves of immigrants. The current immigration crisis is more complex in some ways, however, since it is overlaid on a long and troubled history of racism and discrimination suffered by Hispanics, particularly those in the Southwest (Carter, 1970; McWilliams, 1968). From the standpoint of the U.S.'s non-Latino population, it is difficult to disentangle current attitudes toward recent Latino immigration from racist attitudes of the past toward Hispanics who were native to the U.S. or even whose families lived here before the American Southwest became part of the United States. And even within the overall Latino population, as we will see, responses toward the new immigrants have created new tensions and fissures, adding another layer of complexity.

Presently, more than 10% of the total U.S. population—nearly 27 million residents—is of Hispanic[2] origin (U.S. Bureau of the Census, 1995a). As many scholars have noted, the U.S. Hispanic population is extremely diverse and its numbers difficult to estimate because of the many undocumented immigrants (Suárez-Orozco & Suárez-Orozco, 1995). In general, however, the U.S. Hispanic population comprises individuals who were either born in or whose families originated in Mexico, Central or South America, Puerto Rico, Cuba, or other parts of the Caribbean. Of the 27 million Hispanics in the U.S., over 40% are either foreign-born or born in Puerto Rico (see Table 1).

Latino immigration, particularly in those states and regions already with the highest concentration of Latinos (e.g., California, Texas, New York, Illinois, Florida), has helped alter the U.S. demographic landscape over the past quarter century and will continue to do so. Consider the following:

- In 1960 fewer than 600,000 U.S. residents were Mexican-born. In 1994 the Mexican-born population had grown to nearly 6.2 million, more than a tenfold increase. In contrast, the U.S.-born population in the U.S. increased by less than 40% during this period (U.S. Bureau of the Census, 1975; 1995a, Table 1).
- In 1960 fewer than 50,000 U.S. residents were born in Central America. By 1990 (the most recent year with complete data), they numbered over 1.1 million (U.S. Bureau of the Census, 1990a, Table 13), a twenty-threefold increase.[3]
- More than 10 million of the foreign-born population in the U.S. (46% of the 23 million total foreign-born) are Hispanic. By far the single largest group within the foreign-born population–6.7 million–is Mexican;

the third and fourth largest groups are from Cuba, 805,000, and El Salvador, 718,000 (*INS: Numbers, Criminals, Sanctions*, 1996; U.S. Bureau of the Census, 1995b).

• Approximately 2 million of the 4 million illegal immigrants in the U.S. are Latino ("U.S. foreign-born up, immigration down," 1995; Warren, 1994). Again, Mexicans comprise the single largest group, about 40% of the total illegal immigrant population; Central Americans make up another approximately 18% of total illegal immigrants in the U.S.

• Some states are far more affected by immigration than others. Four states have more than half the foreign-born population living in the U.S.: California has 34.3%; Florida, New York, and Texas together account for another 25.6%. Illegal immigration has also had the greatest impact on California. Its illegal population was estimated in 1994 at 1.6 million. Texas claims 405,000 illegal immigrants, Florida 373,000 (Loh, 1994). The majority of these illegal residents are Latino, but exact numbers are unknown.[4]

• Between 300,000 and 350,000 Hispanic immigrants, mostly from Mexico and Central America, are expected to arrive in the U.S. yearly during the next half century (Day, 1993). By 2010 Hispanics will number more than 40 million individuals; by 2040 over 80 million Hispanics will be living in the U.S., 22% of the U.S. population and more than twice the current percentage. By 2050, nearly 25% of the U.S. population is projected to be Latino (U.S. Bureau of the Census, 1996a).

Significantly, many Latino immigrants come to this country with low levels of education and few material resources. Mexican and Central American immigrants, who make up nearly a third of the total U.S. Hispanic population and two thirds of the Hispanic immigrant population (see Table 1), tend to have relatively little formal education and are more likely than native-born U.S. residents to be living in poverty. Fewer than 25% of Mexican immigrants and 46% of Central American immigrants have the equivalent of at least a high school diploma; bachelor's degrees are held by only 3.5% of Mexican immigrants and fewer than 9% of Central American immigrants. In contrast, 77% of U.S.-born adults and almost 60% of non-Latin American immigrants have at least high school degrees; over 20% of U.S.-born adults and non-Latin American immigrants have at

Table 1. 1994 U.S. Population (in thousands) by Hispanic Origin and Birth Place

Place of Birth	Total U.S. Population[1]	NON-HISPANIC VS. HISPANIC		HISPANIC POPULATION: ETHNICITY-ORIGIN				
		Non-Hispanic	Hispanic	Mexico	Puerto Rico	Cuba	Central & South America[2]	Other Hispanic
TOTAL	259,753 (100%)	233,107 (100%)	26,646 (100%)	17,090 (100%)	2,776 (100%)	1,111 (100%)	3,725 (100%)	1,944 (100%)
U.S.-born	233,515 (89.9%)	218,629 (93.8%)	14,823 (55.6%)	10,653 (62.3%)	1,552 (55.9%)	303 (27.3%)	1,044 (28.0%)	1,270 (65.4%)
Foreign- or Puerto Rican-born	23,753 (9.1%)	12,354 (5.3%)	11,399 (42.7%)	6,193 (36.2%)	1,143 (41.2%)	796 (71.6%)	2,624 (70.4%)	642 (33.0%)

[1]Percentages in columns; columns do not add to 100% because persons born in outlying areas (e.g., Guam) or persons born in a foreign country but who had at least one parent who was a U.S. citizen are omitted.

[2]In latest data (U.S. Bureau of the Census, 1995a) no distinction is made between Central and South American origin. Based on previous breakdowns (U.S. Bureau of the Census, 1990), we can estimate that the "Central and South American" category is approximately evenly divided between the two.

Source: U.S. Bureau of the Census, 1995a, Table 1

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least a bachelor's degree ("Education and the foreign-born," 1993). Mexican and Central American immigrants are also more likely to be living in poverty: 36% of Mexican and 26% of Salvadoran immigrants—in contrast to only 14% of native-born U.S. residents and 18% of other immigrants—have incomes below the poverty line (U. S. Bureau of the Census, 1995b).

Native Reactions: Propositions and Policies to Limit Immigration

Response to this influx of poor and working-class immigrants is reminiscent of what happened over 100 years ago. In November 1994 Californians, not-so-faintly echoing their 1879 vote to keep Chinese laborers out, resolutely passed Proposition 187. This measure would not directly exclude immigrants; it was aimed only at preventing illegal immigrants from receiving educational, medical, and other social services. Moreover, Proposition 187 passed by a much narrower—though still a substantial 59% to 41%—margin than the overwhelming 175 to 1 vote a century before. Nonetheless, parallels between the two exist. In a time of economic difficulty, when the number of immigrants is rapidly rising, politicians and the public are uneasy and angry; they want the government to stop what they see as an onslaught. The popular perception is that immigration—particularly illegal immigration—is out of control and wreaking economic havoc. (See Suárez-Orozco & Suárez-Orozco, 1995, who dissect nativist responses to Latino immigration in the 1990s and challenge the proposition that immigrants, legal and illegal, cost more in services than they contribute in taxes and economic activity.)[5]

The legislative process that ultimately resulted in California's Proposition 187 was showing its earliest stirring by 1993:

> Prodded by the slumping California economy and the belief that undocumented immigrants are draining the state treasury, a zealous group of Sacramento lawmakers is carrying an uncommonly large slate of legislation designed to make the state less hospitable to such newcomers. (Bailey & Morain, 1993, p. A-3)

Zealous politicians were not the only ones wanting to limit immigration. Organized labor and many traditional defenders of minority civil rights also helped create the momentum that led eventually to Proposition 187:

> Many black Americans are worried . . . that political gains by new immigrants may come at their expense. Against that backdrop, an expanding number of ethnic leaders have begun to view each other less as oppressed colleagues who must fight together for larger pieces of the pie and more as intense competitors for the same slice of the American Dream. . . . One black observer familiar with the issue who asked that his name not be used [said], "This is a major dilemma for civil rights organizations. There's a lot of tension that over time will intensify." (Fullwood, 1990. p. A20)

Both organized labor and the NAACP supported employer sanctions as a means of reducing illegal immigration when Congress passed the immigration reform bill in 1986 (Fullwood, 1990). In the 1970s even the revered labor leader César Chávez reportedly called illegal immigrants from Mexico a "severe problem" and routinely reported undocumented farmworkers to federal authorities (Silverstein, 1994).

Antagonism toward immigrants is undoubtedly stronger among non-Latinos than Latinos. But despite what many immigrants' rights advocates say, anti-immigration sentiment is not simply masked racial discrimination. Resentment over the influx of new Latino immigrants is strong among many second-, third-,

and fourth-generation families in Latino enclaves such as East Los Angeles. Decrying the "wetbacks" they say are taking their jobs and overrunning their neighborhoods, many seem to feel as this third-generation Mexican American does:

> These things gnaw at us. It's as if someone comes up to you with a gun and takes your money away. The guy with the gun is the immigrant who by his lifestyle is depressing the value of my property by $15,000 to $20,000. (Nazario, 1996, p. A1)

Among U.S.-born Mexican Americans, 75% believe too many immigrants are arriving (Nazario, 1996). More than one-third (37%) of California Latinos say that reducing *legal* immigration to the U.S. would be "a good idea"; 40% support national ID cards to help curb illegal immigration (Tomás Rivera Center, 1996). And almost one-third of California's Latinos supported Proposition 187, the statewide ballot initiative to cut off all services to illegal immigrants (Nazario, 1996).

Proposition 187 was designed to ease the fears and anxieties of Californians worried about immigrants taking jobs, raiding the treasury, and generally becoming ever more intrusive in the state. It would ban illegal immigrants' receiving public education, nonemergency medical care, and social services and require school and other officials to report suspected illegal immigrants to federal authorities. The expectation among supporters of the initiative is, of course, that these measures would discourage further immigration and encourage the early departure of many already here. Some scholars dispute this, arguing that immigrants come for jobs and family reunification, not education and other "free" social services (Cornelius, 1996).

At the moment, however, we do not know what effect Proposition 187 will have because it remains tied up in the courts, its fate uncertain. A federal judge in Los Angeles ruled that most of its major provisions conflict with existing federal law. Lawyers and partisans for both sides say that the matter will not be resolved until the case reaches the U.S. Supreme Court (Feldman, 1995). Proposition 187 has created a climate of uncertainty and fear, signaling that most of the state's citizens want to curtail services and increase education costs to illegal immigrants (McDonnell, 1995), but it has changed virtually nothing procedurally in the state.

With respect to schools, the relevant law is federal and based on *Plyler v. Doe*, a 1982 Supreme Court ruling in a Texas case. The Court held that schools could not refuse school attendance to students based solely on immigration status. In explaining the Supreme Court's reasoning, Justice William Brennan wrote that denying school access to illegal immigrants would lead to "the creation and perpetuation of a subclass of illiterates within our boundaries, surely adding to the problems and costs of unemployment, welfare, and crime" (Pyle & McDonnell, 1996, p. A25).

Plyler was used last year to force an Arizona school district to drop its long-standing practice of asking students about their citizenship status and requiring many foreign-born students to obtain visas before enrolling in school (Schnaiberg, 1995). Many believe that Proposition 187 will ultimately be declared unconstitutional on the basis of *Plyler* and constitutional provisions prohibiting states from usurping federal powers.

Nonetheless, a move toward change is underway—and not just in California. As happened in the last century, a strong vote for immigration reform in California seems to presage public and policy shifts nationally. A national 1993 Gallup Poll found that 65% of those surveyed—double the percentage in 1965—favored restrictions on immigration. A 1992 poll found that 68% of respondents thought immigration was now "bad for this country" (Savage, 1995, p. A23). Many constitutional scholars think *Plyler* is also highly vulnerable. A conservative majority on the Supreme Court and changes in state and national legislation could

cause the Court to overturn its earlier decision (Pyle & McDonnell, 1996). Efforts are underway to place Proposition 187–type initiatives on the Florida and Arizona ballots in November ("Florida's Growth," 1996). In the U.S. Congress, Speaker of the House Gingrich has "embraced . . . a new Proposition 187–style solution" to illegal immigration (Lacey, 1995, p. A35). Then in March and April of this year, the House and Senate passed legislation aimed at sharply curtailing illegal immigration by increasing border patrol enforcement, increasing penalties for smugglers and document counterfeiters, and placing tighter controls on public aid.

The House version included a provision, consistent with California's Proposition 187, that would allow states to deny public education access to students who are in this country illegally (Lacey, 1996; "Senate tackles," 1996). This provision is unlikely to become law any time soon, however. It was not part of the Senate bill, and President Clinton has vowed to veto any immigration legislation that denies schooling rights to students. Several police organizations have furthermore condemned such a provision ("Senate tackles," 1996). But its growing appeal nationally and *Plyler's* increased vulnerability in the courts suggest that this aspect of "immigration reform" will continue to receive attention.

Legal immigration is also a target of reform, although it has not created the furor caused by illegal immigration. Last year a bipartisan commission chaired by the late Texas Congresswoman Barbara Jordan urged cutting by one-third the number of immigrants legally admitted annually to the U.S., from about 800,00 to about 550,000. In order to protect U.S. workers from immigrant labor competition, the commission recommended barring unskilled workers who want to enter for employment purposes and charging a steep fee to employers who wish to hire highly skilled foreign professionals. For a time the Jordan Commission's recommendations enjoyed broad-based support: the Clinton administration endorsed them immediately (Hook, 1995), and the House Judiciary Committee approved legislation based on the Commission's recommendations (Oberlink, 1995). If enacted into law, this legislation would have constituted the first major restrictions on legal immigration in 71 years (Savage, 1995). Congress, however, rejected any changes in legal immigration, at least in 1996 ("Senate tackles," 1996). But the debate over immigration, both legal or illegal, is sure to continue into the next century.

Latino Immigrants and U.S. Schools

The schools have felt acutely the effects of the immigration explosion of the past 25 years. Regardless of what ultimately happens with California's Proposition 187 and the various efforts nationwide to restrict immigration and limit educational access, U.S. schools will undoubtedly have to deal in the foreseeable future with increasing numbers of Latino students, many of them Spanish-speakers. A large and young Mexican– and Central American–origin populace virtually assures growing numbers of Latino students in U.S. schools (Day, 1993). In contrast to the median age of 35 of the white, non-Hispanic population, the median age of the Mexican-descent population is 23, of the Central– and South American–descent population 27 (U.S. Bureau of the Census, 1995a)—prime child-bearing years. Even if immigration were to end altogether, the proportion of Hispanics in the U.S. population would nearly double from 10% today to 18% in 2050 (Archer, 1996). If current immigration patterns continue, by 2030 nearly one-fourth of the school-age children in the U.S. will be Hispanic (Rosenblatt, 1996).

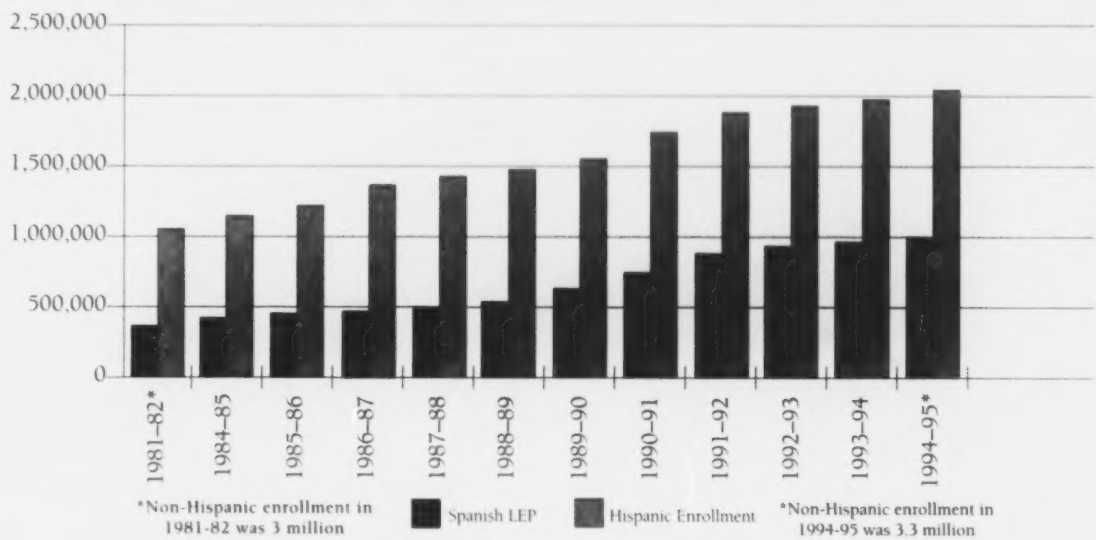
Approximately 6 million Hispanic students, of 50 million students total, are in grades K–12 in U.S. schools (U.S. Department of Education, 1994a). It is estimated that nearly 2 million of these students speak Spanish as their primary language and are not fluent in English (Fleischman & Hopstock, 1993; National

Clearinghouse for Bilingual Education, 1995). The number of limited English speakers has risen dramatically over the past two decades and continues to grow. At a time when the size of the general school population has remained essentially stable, the number of limited English proficient (or "LEP") students (three-fourths of whom are Spanish speakers) grew by 85% nationwide between 1985 and 1992—from fewer than 1.5 million to almost 2.7 million (National Clearinghouse for Bilingual Education, 1995).

The growth in California has, again, been most dramatic. From 1981 to 1995, while non-Hispanic enrollment grew slightly more than 10%, the number of Hispanic students in California public schools nearly doubled to more than 2 million students, and the Spanish-speaking LEP population increased by nearly 250% to almost 991,000 (Figure 1). In 1994–95, Spanish-speaking LEP students made up nearly 19% of the total public school enrollment in California.

Schools in Texas, New York, Florida, and Illinois have also been profoundly affected by the large surge of immigration in the past two decades; however, limited English proficient students are increasingly becoming a national phenomenon. By the early 1990s they comprised more than 5% of the school-aged population in 11 states (U.S. Department of Education, 1994b, Table 46-2). In the 1991–92 school year, Spanish-speaking students in particular were in nearly 4,500 of the nation's 15,000 school districts. A majority of these districts—2,758—had at least 50 Spanish-speaking LEP students; more than 1,100 had at least 100 Spanish-speaking LEP students (Fleischman & Hopstock, 1993, Table VI-2). These numbers have almost certainly increased in the past five years. Even in traditionally Caucasion, English-speaking areas such as Utah, Spanish speakers are beginning to have an impact. The number of Latino students in the state has risen 75% over the past decade. A recent article in *Education Week* notes that "the enrollment in Salt Lake's schools makes it clear

Figure 1. Spanish-speaking limited English proficient (LEP) enrollment and total Hispanic enrollment in California public schools, 1981–82 to 1994–1995[1]



[1]Hispanic enrollment data for 1982–83 and 1983–84 were not collected.
Source: California State Department of Education (1996)

that the city has more in common with New York City and Los Angeles than you might imagine" (Lindsay, 1995, pp. 25–26).

Unfortunately, our schools' response to the challenge of non–English-speaking students has been uneven, fitful, and laced with controversies, such as those swirling around bilingual education (Crawford, 1991). Critics argue that, either by design or default, immigrant and language-minority students have been ignored in current reform efforts (McDonnell & Hill, 1993; Olsen et al., 1994). As noted previously, this is a population that confronts numerous risks, e.g., low levels of formal schooling, high incidence of poverty (U.S. Department of Education, 1995), and various forms of discrimination. Hispanic preschoolers, whether U.S.- or foreign-born (McCarthy & Valdez, 1986), attend preschool at less than half the rate of their white counterparts—17% of all Hispanic 3- and 4-year-olds are in preschool, in contrast to 38% of white students (U.S. Department of Education, 1995).

Latino youngsters tend to do poorly in U.S. schools, having lower levels of achievement and higher dropout rates than their white counterparts (Valencia, 1991). Despite some progress over the past 15 to 20 years, 85% of Hispanic fourth and eighth graders still read at a "basic" level or below. Over half score even below "basic," meaning they cannot demonstrate understanding of a text written at their grade level (Mullis, Campbell, & Farstrup, 1993). Achievement gaps between Latinos—both U.S.- and foreign-born (Kao & Tienda, 1995)—and whites in all academic areas appear early and persist throughout their schooling careers. For example, 17-year-old Latinos read only slightly better than 13-year-old white students (U.S. Department of Education, 1995). The overall picture for students from Spanish-speaking backgrounds is troubling indeed. It is critical, therefore, that we develop and identify effective programs to improve academic achievement for this population of students. Bilingual education was developed precisely to meet this need, but as we will see, bilingual education is not sufficient.

The Bilingual Education Controversy

Many school programs are failing to help Spanish-speaking children achieve at acceptable levels, even in their native language. But achievement might be even worse when these students are immersed in English, without benefit of opportunities to learn and develop in their first language. Controversial as it is, there is evidence that bilingual education can work: In many studies, children who were taught content and skills in their native language (in this case, Spanish) fared better academically in English; they were able to develop academic skills using Spanish while they were acquiring English language skills (see below). It might seem counterintuitive that more instruction in Spanish leads to superior outcomes in English; however, we should not forget that sailing west to get to the East was also once considered counterintuitive.

Regardless of the controversy over whether learning in Spanish promotes or retards academic development in English, it is undoubtedly the case that children who are taught in their native language develop higher levels of proficiency in that language than children who are directly immersed in a second language (e.g., English [Legarreta, 1979, and Plante & Skoczylas, as cited in Rossell & Baker, 1996]). Bilingual/biliterate development ought to be seen as a positive outcome of any educational program. Even Rossell and Baker, prominent critics of bilingual education, suggest that "rather than viewing limited English proficient children as a burden, we ought to view them as an opportunity to develop bilingual adults" (1996,p. 35). Whether primary language maintenance and bilingual development come at the cost of timely English acquisition is a question that has generated enormous controversy and awaits definitive answers. (See Rossell & Baker, 1996, for the latest in a long line of scholarly and polemical statements about the effectiveness of bilingual education.)

There is even controversy among Latino parents, increasing numbers of whom are objecting to bilingual education and use of

Spanish for their children's academic instruction (Schnaiberg, 1996). In a recent nationally publicized incident, Latino parents in a Los Angeles school insisted that their children be taught in English; they worry that Spanish-language instruction will hamper their development in English. The beleaguered school administration defends the current bilingual program, claiming that children are acquiring English sooner than they would with an English immersion program. However, the principal says, "we won't see how well our children gain until five years into the program" (Pyle, 1996, p. A-8). Parents are unconvinced—and worried.

I will not review bilingual education theory and research here. Interested readers are referred to Crawford (1991), *Bilingual Research Journal* (1992), and Rossell & Baker (1996). In brief, however, those who promote using the child's home language extensively in school argue that (1) a child learns most readily in the language he or she knows best, whereas learning new knowledge and skills in English while at the same time trying to learn English can be academically crippling for many; (2) one can learn a great deal academically in one's home language while simultaneously learning how to speak and understand a second language; (3) what one learns in a first language is still known when one learns the second; in fact, what a person learns in a first language actually helps in learning a second, because the second-language learning becomes more meaningful; knowledge and skills learned in the first language are available in—that is, they transfer to—the second language.

Both the theory and practice of bilingual education remain enmeshed in controversy on many levels—substantive, political, ideological, and methodological. Nevertheless, bilingual education can claim successes (Krashen & Biber, 1988). Better designed and implemented studies are more likely to find positive effects of using children's primary language for instruction (Willig, 1985). Spanish-speaking students can also start to "catch up" with English-speaking students if they are in bilingual programs that use Spanish through much of elementary school (Collier, 1992; Thomas, 1992).

Yet evaluations of bilingual education's effects are mixed. Even some of the most successful bilingual education models, such as one pioneered by the California State Department of Education (Gold & Tempes, 1987), sometimes fail to produce desired effects. A reanalysis of the California bilingual education "Case Studies" concluded that at least one of four schools—located in a neighborhood where children heard virtually no English outside school—was *less* successful in promoting English reading achievement after the introduction of a bilingual education model (see Crawford, 1991, for description of the Case Studies project). The authors of the study argue that the efficacy of bilingual program models depends to some extent on the social and linguistic context of the school and community. If children hear very little English outside school, excessive amounts of time in primary language instruction might indeed delay English acquisition (Samaniego & Eubank, 1991).

In other studies, methodological issues cloud the findings. A National Research Council panel concluded, for example, that a national evaluation of bilingual education (Ramírez, 1992) demonstrated that kindergarten and first-grade students who received academic instruction in Spanish had higher achievement in English reading than did comparable students who received academic instruction in English (there were no significant differences in language and mathematics). But high attrition rates and noncomparability of sites and students prevented any valid conclusions past first grade (Meyer & Fienberg, 1992).

Such ambiguity notwithstanding, the fact remains that *many Latino students experience low levels of academic attainment, even when they are taught and tested in Spanish* (Escamilla, 1994; Gersten & Woodward, 1995; Goldenberg & Gallimore, 1991; Slavin & Madden, 1995). Nationally, first-grade children tested in Spanish achieve, on average, below two-thirds of their

peers tested in English; in the second and third grades, still taught and tested in Spanish, they score lower than nearly three-fourths of the students (CTB/McGraw-Hill, 1982, 1988). In Massachusetts, the first state to pass a law promoting bilingual education (in 1971), Hispanic students in bilingual education programs continue to perform well below state and national norms (Commonwealth of Massachusetts, 1994). "Two-way" bilingual education offers, however, a promising new approach. In two-way programs, the goal is to help both language-minority (e.g., Spanish-speakers) and language-majority (e.g., English-speakers) children develop competence in both languages. Evaluations suggest that these programs have very positive effects on the academic achievement of Spanish-speaking children, the development of second-language skills among English-speakers, and improved relations among English- and Spanish-speaking students (Christian, 1994).

Whatever we might conclude about the benefits of instructing in the primary language, it is evident that even with such instruction many Latino students achieve at unacceptably low levels. Greater poverty and lower levels of parental education place these children at risk for educational underachievement, regardless of instructional language. Our attempted solutions must therefore go beyond bilingual interventions. As noted a decade ago, bilingual education outside the context of an effective school is unlikely to enhance learning for students who traditionally have been poorly served (Carter and Chatfield,1986). Schools must also focus explicitly on academic achievement, in whichever language students are learning; they must stress effective and sustained leadership, improved instruction, and opportunities for teachers' professional development. I will return to these themes in the report's final section describing a school improvement project in Southern California.

"I Want Him to Have a Career, a Better Education . . ."

Amid the rather bleak scenario described above, Latino parents represent an invaluable resource for their children's schooling (Goldenberg, 1987, 1993). They care deeply about their children's education and could make profound contributions to improving students' academic achievement. Unfortunately, many educators assume that Latino parents lack the interest, time, and ability to help children succeed in school; they also assume that fundamental differences in values between schools and Latino families create serious obstacles to children's academic achievement (Grossman, 1984). These assumptions are incorrect.

Parents want their children to succeed in school. Contrary to the popular portrait—particularly of Latinos thought to be mired in a "culture of poverty"—Latino parents are extremely interested in their children's formal schooling (Azmitia et al., 1994; Delgado-Gaitan, 1990; Delgado-Gaitan & Trueba, 1991; Goldenberg & Gallimore, 1995). At least at the elementary school level, parents are optimistic about their children's chances of school success. They want children to do well in school and to obtain as much formal education as possible. They see formal schooling as the way out of poverty and low-level jobs. According to immigrant Latino parents, formal schooling provides job-related qualifications and therefore promotes social and economic mobility. Here are two representative examples of what parents have told us (from Goldenberg & Gallimore, 1995):

> *Yo quiero que tenga una carrera, que tenga una educación mejor, aunque Ud. sabe ya cuando crecen a lo mejor es más difícil, pero si uno los va empujando desde chicos a que agarren una carrera o sea que empiezen a estudiar más fuerte,*

para que el día de mañana, uno diga "Bueno ya no tengo nada que dejarles por lo menos darle el estudio para que tenga más oportunidades para ganarse la vida más fácil que uno." (I want him to have a career, a better education, although you know that once they get older maybe it becomes more difficult. But you can start pushing them to have a career from the time they are young, that is, so they'll study harder, so that tomorrow one can say, "Well, I don't have anything to leave them, but at least I gave them an education so that they will have more opportunities and an easier time than I did.") (p. 192)

Yo trato de inculcarles que ellos deben estudiar, porque ya todo lo que sirve es la preparación . . porque cada día están pidiendo más cosas en los trabajos, depende de lo que dice uno hasta que fue a la escuela así le dan a uno el trabajo, es lo que yo siempre le digo a mi hijo. (I try to inculcate in them that they should study, because what is most valuable is your preparation . . . every day they require more and more at work. Whether they give you the chance of a job depends on what you tell them—how far you went in school. This is what I always tell my son.) (p. 192)

Parents express the view that education would permit their children "to be somebody" (*"ser alguien en la vida"*), something they feel was denied them because of limited education. Of 54 mothers and fathers interviewed in one study (reported in Goldenberg & Gallimore, 1995), all but one expressed dissatisfaction with their own educational attainment. And without exception, parents wanted their children to go farther in a school than they had gone. When one couple (the mother had completed sixth grade, the father ninth) was asked why they wanted their son to finish high school and attend university, the father answered, "We didn't study, and look at us here" (*"Nosotros no estudiamos, y mirenos acá"*).

Parents see school success as instrumentally related to positive outcomes for their children—and they are correct. Data from a subsequent study of 121 Spanish-speaking kindergartners and their immigrant parents (also from Mexico and Central America) confirm what the above quotes suggest: Parents consider formal schooling to be highly consequential for children's futures. Over 90% of the parents said they wanted their children to go to college. When asked whether doing well in school would help children in general and their child in particular to (1) have a better job, (2) make more money, and (3) be happier in his or her life, parents responded overwhelmingly in the affirmative—particularly to the first two questions (Goldenberg & Gallimore, 1995). There were no differences in parents' ratings of the instrumental value of schooling for children in general and for their child in particular.

Parents' subjective beliefs are objectively correct, at least with respect to education and income. Level of schooling is in fact related to income, no less for Hispanics than for whites (see Table 2, next page). Whites' earnings are greater than that of Hispanics at each educational level, but contrary to what some have claimed (Ogbu, 1974; Suárez-Orozco & Suárez-Orozco,1995), more education does *not* mean "more inequality" (Suárez-Orozco & Suárez-Orozco, 1995, p. 60). Table 2 shows that whereas there is a direct relationship between educational attainment and earnings for both whites and Latinos, that is, that earnings at each level of education are higher for each group than are earnings at the previous level, there is no such relationship between educational attainment and income disparity between the two groups. Income disparity between Hispanics and whites is smallest for individuals who have not graduated from high school, increases for high school graduates, decreases with some college or an A.A. degree, increases again for college gradu-

Table 2. Mean 1994 Individual Earnings by Educational Attainment, for Hispanics[1] and Whites, White-Hispanic Differences, and Differences over Previous Educational Levels

EDUCATIONAL ATTAINMENT	MEAN EARNINGS		WHITE-HISPANIC DIFFERENCE AT SAME EDUCATIONAL LEVEL		% DIFFERENCE OVER PREVIOUS EDUCATIONAL LEVEL	
	HISPANICS	WHITES	$ DIFFERENCE	% DIFFERENCE	HISPANICS	WHITES
Not a High School Graduate	$13,733	$13,941	$208	1.5%	—	—
High School Graduate	$17,323	$20,911	$3,588	20.7%	26.1%	50.0%
Some College/AA Degree	$21,041	$22,648	$1,607	7.6%	21.5%	8.3%
BA Degree	$29,165	$37,996	$8,831	30.3%	38.6%	67.8%
Advanced Degree	$51,898	$56,475	$4,577	8.8%	77.9%	48.6%
Column mean for % differences	—	—	—	16.9%	41.0%	43.7%

[1]Hispanics are individuals self-identified as Latin American or Puerto Rican in origin or descent, may be of any race.
Source: U.S. Bureau of the Census, 1996b, Table 19.

ates, then finally decreases for those with advanced degrees (U.S. Bureau of the Census, 1996b).

More to the point, an income increase of more than 20% accompanies each successive educational level for Hispanics. A Hispanic high school graduate, for example, earns 26.1% more than the nongraduate; a Hispanic with an advanced degree earns 77.9% more than the Hispanic with a B.A. Overall, the mean percent increase in income from one educational level to the next is nearly identical for Hispanics and whites (41.0% and 43.7%, respectively) and nearly two and one-half times the mean difference between Hispanics and whites (16.9%) at comparable educational levels (U.S. Bureau of the Census, 1996b).

The persistent income disparity between Hispanics and whites, even at identical levels of schooling, clearly suggests the presence of discrimination and possibly other factors that contribute to depressed earnings of Hispanics. But the data also demonstrate what parents in our studies believe and have told us repeatedly—school attainment is strongly related to increased economic well-being for their children. This salient fact contributes to parents' high levels of motivation for their children's school success. Real and perceived inequality plays little, if any, role in parents' perceptions of the value of formal schooling.[5]

Parents want to be involved in their children's schooling. Immigrant Latino parents express considerable satisfaction when a teacher makes an effort to involve them in their child's academic development. At least in elementary school, the possibility of productive home-school collaboration for this population of students is considerable, probably much greater than many educators realize (Goldenberg, 1987). For example, teachers' attempts to involve parents in children's learning in kindergarten (by sending home notes, materials, suggestions, homework) is positively associated with parents' satisfaction with the kindergarten class. Moreover, teachers' attempts to involve parents in children's learning are positively associated with kindergarten literacy development (Goldenberg & Arzubiaga, 1994). Once children enter elementary school, we find that parents are highly supportive of homework. Their ratings of homework quality and of how well informed they feel about their child's academic progress and the classroom curriculum are all positively related to satisfaction with their child's school experience (Goldenberg & Gallimore, 1995).

Parents' positive attitudes toward formal schooling, their high aspirations for children's academic success, and their eagerness to be involved in their children's formal education mean that schools have available an invaluable resource that can help provide a foundation for substantially improving Latino youngsters' academic attainment. The final section describes how a collaborative venture involving educators and university researchers built upon that foundation.

A School Change Project

The remainder of this report describes an approach to improving the achievement of Latino students that creates, within a bilingual education setting, an explicit, schoolwide focus on improving achievement. The starting point of our efforts lay in our early findings documenting parents' attitudes toward their children's academic achievement.

Our approach has built upon the common interests of educators and Latino families. As described above, parents want very much for their children to succeed in school. We took these findings to heart in setting out to promote enhanced academic development for students schoolwide. We assumed that parents would fully support rigorous efforts to improve student learning. Parents, in fact, sometimes had expressed to us concern over what they perceived to be low standards and levels of learning in this country (Goldenberg & Gallimore, 1991a). Latino parents seem to want for their children what most parents want—a solid academic program that helps children achieve high levels of literacy and increases their chances of success at subsequent stages of schooling. This is what we set out to accomplish.

Colleagues and I undertook this "school change" project beginning in 1990 (Goldenberg & Sullivan, 1994). Although national and state action must also address many of the issues regarding Spanish-speaking children and their education (McDonnell & Hill, 1993), much can be done locally to improve schooling outcomes for these students.

The School and Its Students

Freeman Avenue School (a pseudonym) is one of five elementary schools in a small, heavily Latino school district in Southern California. The district's 27,000 mostly low-income inhabitants occupy an area of less than 1.2 square miles, giving this unincorporated portion of Los Angeles County a population density over twice that of the surrounding metropolitan area. Since 1968 the district has experienced a virtual explosion in student population and fundamental changes in ethnic composition. As a "port of entry" district, it has been profoundly affected by the influx of Latin American immigration. District enrollment has climbed from less than 3,000 mostly white, English-speaking students in 1968 to nearly 6,000 mostly Hispanic and limited English proficient (LEP) students today.

Freeman's demographic makeup reflects that of the district overall: 95% of the school's more than 800 students are Hispanic; 93% come from homes where Spanish is the dominant language; 86% of students are LEP; 89% qualify for free school meals; and another 7% qualify for reduced-priced meals. Hispanic parents—mostly from Mexico and about one-fifth from Central America—have, on average, about 7 years of formal schooling; non-Hispanic parents work in skilled, semi-skilled, or unskilled occupations, suggesting they too have low levels of schooling. Although virtually all Latino parents are immigrants, 75% of the children were born in the U.S.

When our project began in 1990–91, average achievement at the school was below state, national, and district norms. Despite an established and well-regarded bilingual education program, students at Freeman scored between the 7th and 15th percentiles on statewide tests of reading, writing, and mathematics.

Improvements in Literacy Achievement

Within 3 years of the beginning of our project, achievement at Freeman surpassed the rest of the district and in some subject areas matched or surpassed state and national norms. Although much work remains to be done in improving student academic achievement—particularly in helping students make a successful transition from Spanish to English instruction—we have seen meaningful and important progress. For example:

- In 1990 only 31% of Freeman's first-grade students learning to read in Spanish were on grade level in Spanish reading, according to standardized testing; in the rest of the district, 41% of students were on grade level in Spanish. By the time this cohort of students reached third grade (still reading in Spanish), 61% of Freeman students were reading at or above grade level, whereas only 49% of the cohort in the rest of the district were reading on grade level according to nationally standardized tests (Goldenberg & Sullivan, 1994).

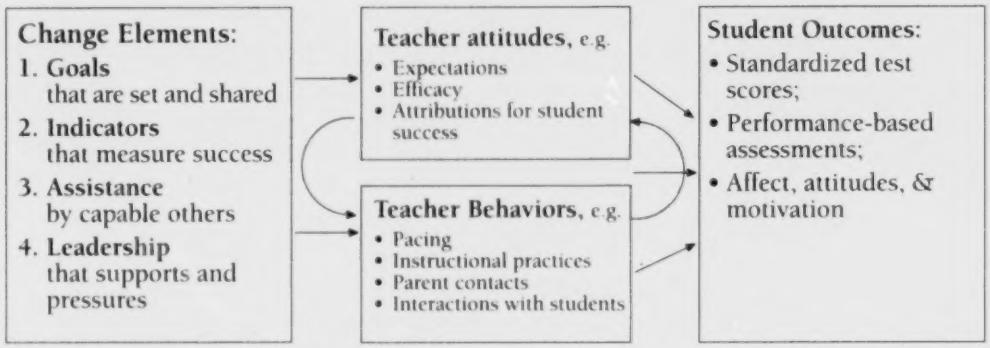
- Before the project began, Freeman students scored below the state and district on tests given in 1989 and 1990 to all fourth graders by the California State Department of Education. By 1993 students at Freeman outperformed students in the rest of the district and did nearly as well as students around the state: 28% of Freeman fourth graders scored at the highest levels (4 and above on a 6-point measure), compared to 17% of students in the rest of the district and 30% statewide (Goldenberg & Sullivan, 1994).

- In 1992 students at Freeman did no better than students around the district on literacy assessments developed for the project to gauge students' reading and writing abilities. Only 31% of Freeman's and 33% of the rest of the district's second through fifth graders could—in whichever language they were receiving instruction—write summaries demonstrating at least a basic understanding of expository and narrative texts, effectively write a summary of a story they had previously read, and demonstrate at least basic proficiency in using written conventions (spelling, punctuation, etc.). In 1995 nearly half (49%) of the second through fifth graders at Freeman could read and write at these levels, whereas among comparable students around the district, only 25% demonstrated these competencies (Saunders, 1995a).

- In 1992 Freeman students reported they had only voluntarily read an average of 5.3 items (books, magazines, stories, etc.) during the previous year, whereas in the rest of the district, students reported reading 9.5 items. In 1995 Freeman students reported reading on their own an average of 13 items over the preceding year; students in the other district schools averaged slightly more than 7 (Saunders, 1995a).

- More informally, educators and others around the district have commented on the improved academic climate and level of achievement at Freeman. One district administrator who supervised summer school, for example, noted that Freeman students were on a higher level academically than other students in the district.

Figure 2. School Change Model



Source: Goldenberg & Sullivan, 1994, and Sullivan, 1994

How did the school achieve these results? The answer, in simplest terms, is that the school principal, the researchers, and a group of teachers set out several years ago to involve the entire faculty in a coherent and concerted schoolwide effort aimed precisely at improving achievement. Raising literacy levels at the school was our unambiguous goal and would be the measure of success. Not all the academic problems at the school are solved by any means, but the school is making progress by using a straightforward approach that builds on *both* the community's and educators' desires to help students succeed in school.

A Model to Guide School Change Efforts

We were guided in our work by a four-element "change model" developed in collaboration with the school's principal (Goldenberg & Sullivan, 1994; Sullivan, 1994). The model was aimed at providing overall coherence to the school's efforts to change, something that is often missing in the current patchwork of attempts to reform or "restructure" schools. Fullan, Bennett, and Rolheiser-Bennett put their finger on a fundamental challenge facing would-be reformers: "The greatest problem faced by school districts is not resistance to innovation, but the fragmentation, overload, and incoherence resulting from the uncritical acceptance of too many different innovations which are not coordinated" (1990, p. 19).

As in many schools over the past decade, particularly those with large numbers of so-called "at-risk" students, a steady downpour of initiatives and changes had fallen on school personnel at Freeman, leaving teachers feeling overloaded and fragmented. With our model of change we sought to provide focus and cohesion, unifying the different activities and initiatives at the school under a common purpose: improving student achievement.

The model (Figure 2) is derived from research on effective schools and educational change and from our own experiences working in school settings with this population of students. It consists of four "change elements" that we hypothesized could influence teachers' thoughts and behaviors, thereby influencing student outcomes:

(1) *goals* that are set and shared;

(2) *indicators* that measure success;

(3) *assistance* by capable others; and

(4) *leadership* that supports and pressures.

Versions of three of the elements—goals, indicators, and leadership—have long been associated with efforts to improve school effectiveness. The other—"assistance by others"—has begun to

receive attention more recently (see Fullan, 1985, 1991; Loucks-Horsley & Mundry, 1991; Tharp & Gallimore, 1988). We predicted that these four elements could be used to influence teacher attitudes (e.g., expectations, sense of efficacy, attributions) and behaviors (e.g., teaching practices, parent contacts, interactions with students) known to influence important student outcomes, such as achievement and attitudes.

There is nothing specific to Spanish-speaking or immigrant students about this model. To the contrary, goals, indicators, assistance, and leadership constitute a generic set of dimensions for "leveraging" sustained, coherent change, regardless of the particular population.

Setting *goals* (element 1, Figure 2) is a venerable practice in 20th-century American education (Tyler, 1949), and more recent educational scholarship supports the idea that common and mutually understood goals are vital for successful change efforts (Carter & Chatfield, 1986; Good & Brophy, 1986; Peterson & Lezotte, 1991). Cognitive models of behavior (e.g., Deci, 1975; Weiner, 1980) suggest that goal-setting matters because goals affect behavior.

Similarly, *indicators* (element 2) of success used in assessing student progress toward goals can effect improvement in student outcomes (Good & Brophy, 1986; Peterson and Lezotte, 1991; Slavin, Madden, Karweit, Livermon, & Dolan, 1990; Tharp & Gallimore, 1988). Indicators complement goals by reinforcing their importance and helping gauge progress.

Assistance (element 3) is also key to successful change. Recent findings highlight the importance of mutual assistance among fellow professionals as a component of successful change—in contrast to traditional bureaucratic approaches, where administrators set policies and guidelines and then hold teachers "accountable" (Rowan, 1990). Existing models for assisting teacher development reject in-services and one-shot workshops in favor of longer-term approaches. Emphasis is on presenting new information, creating settings that encourage discussion and analysis of practice, and providing opportunities to attempt and reflect upon new behaviors (Goldenberg & Gallimore, 1991b).

Finally, *leadership* (element 4) is the element most closely associated with efforts to make schools more effective. A principal's leadership has consistently emerged as the most potent factor in the school-change equation (e.g., Berman & McLaughlin, 1977; Bickel, 1983; Bliss, Firestone, & Richards, 1991; Edmonds, 1979; Fullan, 1991). We hypothesized that in the context of the three other change elements—goals, indicators, and assistance—leadership would produce a tension between *pressuring* on the one hand and *supporting* on the other. The skillful principal, indeed, the skillful leader, will know when to exercise one or the other or both simultaneously. This is perhaps the most elusive but important aspect of leadership (see, e.g., Blase, 1987; Bliss et al., 1991; Huberman, 1983; Miles, 1983).

Although Freeman had a well-regarded bilingual education program in place, teaching the children in their home language was not sufficient, alone, to promote high levels of academic achievement. We expected that the change model, operating within a school that recognizes the validity of children's native language and builds upon teachers' and parents' interest in improving academic attainment, would create a school community where teachers would find new ways to help their students achieve better. We furthermore expected that parents, given their expressed belief in the importance of school success, would support efforts to improve academic achievement. Experience over the past several years has borne out these expectations.

Operationalizing the Model

A brief account of how the change model was operationalized at Freeman follows. (For more detail, see Goldenberg & Sullivan, 1994.)

Goals. Beginning in 1990 and extending over the next two years, an Academic Expec-

tations Committee (AEC), made up of teachers, administrators, and a researcher, met together to conceptualize and put into practice a literacy curriculum with reading and writing goals and expectations. The school's faculty advisory council and entire faculty participated in the process. A final step involved meeting with parents, both English- and Spanish-speaking, to solicit their reactions both to the overall idea of stipulating goals and expectations and their specific responses to the grade-level items in the draft. Parents were extremely positive. One parent said she felt "our standards are a lot lower" than they should be and that "we really need to push our children." She saw the establishing of expectations as going in exactly the right direction.

The parents urged the AEC to write more "parent-friendly" versions—"*mas claro y en pocas palabras*" ("clearer and in fewer words")—and to distribute these at "back-to-school night." In September 1992 we did as they suggested. Overheads highlighting the goals and expectations were prepared and hard copies were made available—which many parents asked for. When they visited their child's classroom, they got "parent-friendly" versions for that grade level. Several teachers commented that parents came into their rooms that evening more enthused than they had ever seen them.

The school's goals reflect a developmental perspective on literacy (Chall, 1983). Children do more than acquire new knowledge and skills over time; their understandings change qualitatively and grow in complexity and sophistication. Fostering literacy thus involves striking a balance between helping them understand the forms and functions of literacy (e.g., that written texts communicate meaning) and helping them acquire the skills required to be literate (e.g., decoding words, using accepted writing conventions). A kindergartner, for instance, is expected to be able to read or "pseudoread" at least a half-dozen favorite story or picture books, know the letters and sounds of the alphabet, begin making rudimentary attempts to write or dictate narratives, and ask and answer questions about favorite books. By fifth grade the student is expected to be able to understand, appreciate, and discuss works from different literary genres; read for pleasure a range of books and other materials; have an extensive reading vocabulary, particularly in areas of personal interest; compose (drafting and redrafting as needed) original stories with conflicts and resolutions; and keep a daily journal of personal experiences.

Indicators. Numerous indicators are used to gauge progress. One of these, "reading book placement," is the grade-level designation of the basal reader the student is currently reading. We had found in an earlier study that when reading achievement improves, students are more likely to be on grade level in their book placement (Goldenberg & Gallimore, 1991a).

An Academic Assessment Committee, made up of teachers, administrators, and researchers, succeeded the AEC and developed other more specific assessment strategies to gauge progress schoolwide. These indicators include yearly spring assessments of independent reading and attitudes toward reading and writing; writing summaries and original story endings; comprehending narrative and expository passages; and use of written conventions. Spring assessment results are shared the following fall with the entire faculty. English and Spanish standardized test scores are also available, although these are not explicitly tied to the goals and expectations.

Assistance. Several types of assistance have been provided to teachers as part of the schoolwide effort to raise academic achievement. For example, all teachers in the school participate in a workgroup of their choice focusing on some curricular or instructional topic, e.g., math, language arts, cooperative learning, or thematic or integrated teaching. Workgroups have become part of the school culture. They provide a consistent setting throughout the year where teachers can discuss and refine strategies for improving teaching and learning, consistent with the overall goals of the project.

Assistance is provided in many other set-

tings. At grade-level meetings throughout the year, teachers meet with their AEC representatives to learn how to score and analyze student writing samples. Collaborating researchers have assisted the principal in setting direction and have assisted committee members and the entire faculty in developing goals and indicators. Workshops and in-services also provide assistance by addressing specific strategies, explicitly related to the overall school effort, for improving student achievement, e.g., techniques for improving writing and reading, using homework and parent involvement, using dictation, and interpreting achievement data.

All of these activities converge on the single, unifying objective: improving student learning in the language arts within a framework created by goals and expectations for student learning. As one teacher commented at the end of the project's third year, "Everything, it all comes together . . . from the very general to very specific, and yet, back to the general, because everyone knows what everyone's doing, and you have your meetings, and then you meet with other people and you see what they are doing. It's like one big classroom instead of one big school" (Sullivan, 1995, p. 1).

Leadership is perhaps the first among equals of the four change elements. It is difficult to see how *goals* can be articulated and widely accepted, *indicators* developed and implemented, and *assistance* systematically and strategically provided in the absence of leadership at the school site. Leadership at Freeman has been provided by numerous individuals, most prominently, the principal, who has managed to skillfully push at times and hold back at others. Teachers perceived the principal's *supportive* role as much more salient than her *pressuring* role (Sullivan, 1995). They saw her providing direction while giving autonomy, sharing decisionmaking, and being fair—qualities that made them feel secure, trusted, valued, and equal with their colleagues.

The researcher-consultants also provided leadership (as well as assistance) in helping the committees develop goals and assessments. Teachers at the school, especially those who served on the Academic committees or who led workgroups, also played leadership roles. For the first time, they were being called upon to ask fellow teachers to change some of their practices and beliefs. Many teachers found this role challenging and even unsettling.

Parent Reactions

As expected, parents have been very positive about schoolwide efforts to improve academic achievement. In the spring of 1995 several Latino parents of fifth-grade students who had been at Freeman since kindergarten were asked to comment on how things at the school had changed over the past few years. Here are sample responses (Goldenberg & Jiménez-Hami, 1995):

> *Sí, siempre están tratando de mejorar todo en general, agarrar nuevas técnicas para que el niño se pueda desenvolver mejor. Nuevas cosas en general. Cuando uno va al "meeting" uno se da cuenta y se entera de lo nuevo.* (Yes. They are always trying to improve things in general, use new techniques so that children will develop competently. New things in general. When you go to the meetings, you realize [what is happening] and you find out about these new things.)

> *Sí . . . hace tres o cuatro años no habían tantas ideas.* (Yes . . . three or four years ago there weren't as many ideas [about how to help children succeed in school].)

> *O sí [la escuela ha cambiado] demasiado. . . . En los estudios han trabajado mucho con los estudiantes. Las maestras se han superado mucho. O sea me he fijado por otras escuelas hay niños que están en segundo y tercer grado y no saben leer y*

> *escribir. Aquí se les exige mucho y aprenden más rapido.* (Oh, yes, [things at Freeman have changed] very much. . . . They [the teachers] have worked very hard with the students. The teachers have really excelled. I have noticed that at other schools there are children in second and third grade who cannot read or write. Here they really expect a lot and the children learn more rapidly.)

Teacher Reactions

Teachers have also responded positively to the project, both reflecting and probably further contributing to the achievement changes. In spring 1994, when asked in a year-end survey how they thought things were going in the school's efforts to improve student achievement, 90% of the teachers responded with a 4 or 5 (5=extremely well). Following are sample comments from teachers, collected over several years of the project. (Unless noted, all quotations are from Goldenberg and Sullivan, 1994.):

Raising expectations. One teacher who was initially skeptical about the entire effort made this observation at the end of the project's second year:

> At first the teachers said, how is this possible? Our kids can't do this. Then [the principal] gave her support, her statement at the large faculty meeting . . . At first I was skeptical and worried, but now I think these expectations give us the opportunity to shoot for more. Now teachers who were afraid of this are willing to work together.

Focusing on goals. Other teachers hold that the goals and expectations help them set priorities in the face of overwhelming responsibilities:

> I've always felt the problem of getting it all in. You know, it's like what goes on the back burner. . . . Now, because of the goals and expectations, . . . I'd say I am more focused. (Saunders, 1995b, p. 15)

Learning skills and strategies. We also have reports of important changes in teaching:

> In the writing group that I'm in . . . every single meeting we discuss what we've done in our classroom, we discuss how to make it better, we discuss where we want our kids to go after that, we discuss so we know what the teachers are working on . . . we pick up new ways to get across skills, we pick up new types of lessons to do, to address what our goals are in a particular subject area.

And the use of a still powerful strategy, homework:

> The upper grade teachers have always given homework, but now they give more of it and they give it more consistently. . . . I think the students respond positively—they're more serious and responsible about schoolwork when they have homework regularly. The homework in-service reminded teachers how homework fits into classroom lessons, how valuable homework is for the kids.

Improving the climate. A second-grade teacher observed in the second year of the project, "The climate has definitely improved. I received a lot of support—praise and positive feedback—from the second-grade teachers for working on academic expectations." A colleague, who the year before could not get away from the school and staff quickly enough, noted, "The school climate is much more positive—there's much less overload." And finally, one vet-

eran teacher observed, "Our school is the best place it's been since it started. There's a real different feeling, a different atmosphere."

Experiencing success. In line with teachers beginning to see a real difference in students' performance, one teacher made this observation:

> From the children I've seen coming in here from other districts that must be similar to ours, I don't think that a lot of places put such an emphasis on academic achievement. [They might just assume] the LEP child may be an economically disadvantaged child. There's more of an acceptance . . . They're just going to be a year or two behind. [Here, the principal] doesn't accept that or just give up. There's no surrendering. We keep trying. We keep trying. And I think we've been pretty successful so far.

Conclusion: Education Is Cheaper Than Ignorance

Bilingual education, Latinos, immigration, limited English proficient students—these have become flashpoints for public policy and educational debates from the West to the East coast, from the lowest to the highest levels of government, and from school-board elections to presidential politics. It's too bad that these debates have dissipated so much energy that otherwise could go toward helping large numbers of immigrant children and the children of immigrants succeed and prosper in our schools and in society. The "Doe" children of *Plyler v. Doe*—who were permitted to resume their schooling following a court order from a Texas federal judge—are now productive, tax-paying citizens, "a little like many other blue-collar schoolchildren across small-town America" (Feldman, 1994, A22). Even former Tyler (TX) superintendent James Plyler, who lent his name to the case and supported the children's expulsion, has changed his mind about trying to keep immigrant children—whether legal or illegal—out of school: "If we don't provide education, children will be a greater burden and cost more in the long run," he told a reporter in 1994. "For taxpayers, it's either pay me now, or pay me later" (Feldman, 1994, A22).

More of these students could undoubtedly be helped to do even better academically, and to the extent they do, the entire society would benefit. A few efforts, such as the one described in this report, have been undertaken to demonstrate that effective instruction, curriculum, schoolwide organization, and home-school collaboration can have substantial positive effects on Spanish-speaking children's academic achievement (see also Carter & Chatfield, 1986; Dianda & Flaherty, 1995; Gold & Tempes, 1987). Intensive local efforts are not enough, however. These must be combined with long-term, systematic research and evaluation in multiple sites to document effects on student outcomes. And state- and national-level policymakers must develop initiatives to deal constructively with the issues educators face as they work to provide effective and equitable educational opportunities for immigrant and language-minority students (e.g., McDonnell & Hill, 1993).

The challenge of educating Spanish-speaking children grows daily. We can and we must bring about meaningful change for these students, even those who come to school not knowing a word of English. Given the large and growing number of these students, American civilization might indeed depend on our response to this challenge. "It has never been demonstrated," the California State Board of Education said in a 1981 legal brief supporting the Texas schoolchildren in *Plyler*, "that education is more expensive than ignorance" (Feldman, 1994, A21).

Notes

[1] See Suarez-Orozco and Suárez-Orozco (1995), who draw similar parallels between past and current immigration waves and responses to them.

[2] "Hispanic" is a heterogeneous category used by the Census Bureau to designate persons of Mexican, Puerto Rican, Cuban, South or Central American, or other Spanish descent, regardless of race. Approximately two-thirds of the U.S. Hispanic population is Mexican or Mexican-origin (see Table 1 in text). There is actually considerable inconsistency and even controversy over the appropriate term to use when referring to the Spanish-speaking or Latin American-origin populations in the U.S. Many members and leaders of the community advocate use of the term "Latino" (del Olmo, 1989; "Hispanic or Latino?" 1989; Smith, 1988). A popular magazine, Hispanic, uses both terms. For example, on a recent cover Hispanic announced its lead article as "To have or not to have? Latinas debate motherhood" (Hispanic, 1995). The Tomás Rivera Center, a respected think tank based in California and Texas, uses both terms, apparently interchangeably. One recent report was entitled, The Latino vote at mid-decade; another California Hispanic perspectives.

There is ample precedent for either term, and the matter, most likely, is one of personal or ideological preference. The populations I refer to in this report may be accurately referred to as either "Latino" or "Hispanic."

[3] The number of Central Americans has continued to increase throughout the 1990s. Salvadoran-born residents alone, who in 1990 numbered 465,000, in 1994 numbered 718,000 (U.S. Bureau of the Census, 1990a, Table 13; 1995b, Table 5); immigrants from Guatemala, Honduras, Nicaragua, and other Central American countries almost certainly increased as well.

[4] The exact number of illegal immigrants is impossible to calculate. The Immigration and Naturalization Service estimates that 4.3 million illegal immigrants currently reside in the U.S. and that the number is growing by about 300,000 per year (J. Evans, personal communication, April 3, 1996). There are no current breakdowns by country of origin (INS Press Office, personal communication, March 14, 1996). The most recent estimates of illegal immigration, which are also broken down by country of origin and U.S. state of residence, are for 1992 (Warren, 1994). The Census Bureau does not ask about legal immigration status in its surveys (K. Hansen, U.S. Bureau of the Census, personal communication, March 11,1996).

[5] As this report goes to press, the RAND Corporation has published an analysis of post-1990 studies estimating the costs of legal and illegal immigration to taxpayers (Vernez & McCarthy, 1996). Not surprisingly, cost and revenue estimates, assumptions, and findings vary considerably across studies. Yet it appears that illegal immigrants "cost" more, in terms of services they receive, than the total amount of taxes and other revenues they generate—although the size of this "cost" varies significantly in the different studies. The cost of illegal immigrants must be qualified in at least three ways, however: First, analyses done at the state and local level show that native-born U.S. citizens also cost more than the revenues they generate. In other words, even though the "deficit" for the native-born is less than that for illegal immigrants, every resident produces a deficit at the state and local level. Vernez and McCarthy attribute this finding to the studies' failure to take into account all state and local revenue sources and other accounting artifacts. Second, Vernez and McCarthy argue that while the discrepancy between the cost of services and revenues generated is larger for illegal immigrants than for native-born citizens and legal immigrants, this is a function of their lower incomes and hence lower revenues generated; it is not due to their illegal status per se. Finally, the studies reviewed by Vernez and McCarthy have virtually ignored other aspects of this complex issue, for example, longer-term and lifetime effects of the economic activity of immigrants (whether legal or illegal), in contrast to year-by-year accountings of state, local, and national coffers. It might be that some front-end costs, such as education, pay dividends in "higher public revenues much later in life" (Vernez & McCarthy, 1996, p. 28). As with so many other aspects of this difficult set of issues, much depends on the ideological lens through which findings are viewed.

[6] John Ogbu (1974) first propounded the thesis that for "caste-like" minorities such as African-Americans and Latinos, the economic benefits of formal education were disproportionately low compared to the benefits for whites. This fact, Ogbu argues, depresses minority group members' school achievement motivation. Whites can expect a high return on their educational investment, and each successive level of attainment brings enhanced economic and social rewards. Because of racism and discrimination, however, the rewards of formal schooling are much more tenuous for caste-like minorities, according to Ogbu, with more formal schooling translating into greater social and economic inequity. Consequently, members of these minority groups are less motivated to expend effort in school, and they therefore do less well academically. More recently, this thesis has been articulated by Suárez-Orozco and Suárez-Orozco (1995) in their study of achievement motivation among Latino adolescents.

The thesis is compelling but not supported by available data, as the present discussion and Table 2 show. Suárez-Orozco and Suárez-Orozco use U.S. Census data for high school and college graduates only, which give an incomplete picture. In addition, the data they use appear to be based on a comparison between white males and Hispanics overall (that is, both males and females), which of course confuses the issue since both ethnicity and gender are strongly and independently related to earnings differentials. It was impossible to verify the precise basis for their comparison, however, since the source they cite (Hollman, cited in Suárez-Orozco & Suárez-Orozco, 1995) does not actually report income by educational attainment (Hollman, personal communication, May 20, 1996). In any case, even Suárez-Orozco and Suárez-Orozco's data show that income rises as education level rises for both whites and Hispanics. This, for the parents, seems to be the critical fact, more than workplace discrimination.

One final point: There seems to be considerable disagreement among Hispanics as to the degree of discrimination they suffer in the job world. In a recent poll, a majority of California Hispanics (56%) thought "that a Latino in [their] community has as good a chance as an Anglo in getting a job for which they are both qualified." Forty percent disagreed (Tomás Rivera Center, 1996).

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Upcoming issues will cover:

- the inclusion of children with disabilities in preschool settings,
- child nutrition and behavioral development, and
- graduate training in applied developmental science.

From the Editor

Please note that, owing to unavoidable delays in publication of *Social Policy Report*, issue No. 4 of 1995 was omitted. The current issue, 1996, No. 1, presents an up-to-date account of Latino immigration and schooling. Subscribers of 1995 receive this issue as the fourth of their year's subscription, and ongoing subscribers and members of SRCD will be receiving Nos. 1 to 5 for 1996.

About the Author

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Past Issues

Volume IV (1990)

No. 1. (Spring) *Social science and the prevention of children's injuries.* Penelope H. Brooks and Michael C. Roberts.

No. 2. (Summer) *Child mental health: Service system and policy issues.* Judith H. Jacobs.

No. 3. (Autumn) *Pediatric AIDS and HIV infection in the United States: Recommendations for research, policy, and programs.* Linda A. Valleroy.

No. 4. (Winter) *Antecedents of illiteracy.* Barbara A. Fox.

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No. 4. (Winter) *Rhetoric or reality: Child and family policy in the United States.* Francine H. Jacobs and Margery W. Davies.

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SOCIAL POLICY REPORT
Society for Research in Child Development

Volume X, Numbers 2 & 3 1996

Inclusion of Young Children with Disabilities

Contents

2 Is the Emperor Wearing Clothes? Social Policy and the Empirical Support for Full Inclusion of Children with Disabilities in the Preschool and Early Elementary Grades

Bryna Siegel

Finding little empirical evidence to support a clear academic advantage of inclusion over segregated education, the author discusses the possible social benefits and also the many methodological problems with much of the research. She makes several recommendations for how placement decisions might be made more appropriate and research more informative.

18 Inclusion at the Preschool Level: An Ecological Systems Analysis

Samuel L. Odom, Charles A. Peck, Marci Hanson, Paula J. Beckman, Ann P. Kaiser, Joan Lieber, William H. Brown, Eva M. Horn, Ilene S. Schwartz
Early Childhood Research Institute on Inclusion

This article proposes that research on inclusion be expanded to take in the many layers of influence that affect the child with disabilities, beyond the immediate classroom. Thus, how families relate to the school, for example, or how agencies administer programs and how cultural beliefs determine children's experience all become targets of interest in evaluating inclusion.

31 A Comment on Inclusion: Research and Social Policy

John Filler

To reconcile the different perspectives, the commentator focuses on the definition of inclusion, calling for more precision in the use of this term. He points out that whether programs are judged effective depends on how inclusion is defined, what the expectations are for the intervention, and which children are included. He also discusses the costs involved and implications for policy.

33 Update on the Reauthorization of IDEA

Editor

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Is the Emperor Wearing Clothes?

Social Policy and the Empirical Support for Full Inclusion of Children with Disabilities in the Preschool and Early Elementary Grades

Bryna Siegel

The 5-year-old kindergartner with moderate to severe disabilities is, by definition, performing at approximately 50% or less of chronological age in one or more domains of development (DSM-IV, 1994). This child is likely to speak in single words or short phrases, play with toys in a concrete fashion, see all peers as having equal potential as playmates, and may not have yet developed a hand preference for holding a writing instrument. Her more typically developing peer, in contrast, speaks in paragraphs, plays elaborate imaginative games, has specific friendships, and has mastered writing her name and the alphabet. These children, both those with and without significant disabilities, are the focus of this report, which

(1) traces the development of policy on mainstreaming and inclusion of children. with developmental disabilities in non–special education, regular classes;

(2) reviews research on academic outcomes of the full inclusion of children with moderate to severe cognitive disabilities at the preschool through early elementary grade levels;

(3) provides additional information and results from studies of children with milder cognitive disabilities and studies which investigated social outcomes;

(4) discusses methodological problems that plague the research; and

(5) makes recommendations for improving the implementation and research of inclusion.

Developing Policy

In recent years special education practices have evolved rapidly under social and political pressures to bring individuals with disabilities into the mainstream. In schools, this began with *mainstreaming,* the educational practice of including special education students in regular classrooms for parts of the school day. There followed the practice of *full inclusion,* whereby special education children are in the regular classroom full time.

The impetus for the inclusion movement has been three-fold. It has been held that children with disabilities will show more age-appropriate behavior and improved performance as a result of being integrated with nondisabled peer models and undertaking more advanced, albeit "adapted," curricular content; that children with disabilities will show more age-appropriate behavior if they are not exposed to other children with behavioral deficits or excesses; and that because increased access to special education over the last 20 years has failed to produce "good enough" results, inclusion can be justified as an end in itself.

Competing Pressures

PARENTS

Much of the call for inclusion has come from parents of children with disabilities. Many

favor inclusion because they see it as less stigmatizing to their child and family. They see more advantages than disadvantages, especially at the outset of schooling; their child is exposed to the real world, and the practice is held to promote community acceptance of students with disabilities. Some may be unwilling or not yet able to accept the understandably painful reality that their child is permanently disabled (Siegel, 1996). And most special educators, as well as special education legal advocates, are familiar with at least some parents of children with moderate to severe disabilities who express the expectation that truly "appropriate" special education will be able to reverse their child's status.

The same parents may, however, point out possible drawbacks of inclusion, for instance, a lack of individual help or absence of specially trained teachers (Bailey & Winton, 1987). Through existing laws, parents who request inclusion are often given it, but with so few special resources attached that the child subsequently fails in the inclusion setting through the eruption of behavioral difficulties that sorely distinguish him or her from others in the class. Such parents have described inclusion as a "cruel sales pitch" from school districts who may see it as cost-effective compared to segregated special education (Webb, 1994).

Teachers

Some teachers are unwilling or unable to handle special education students in a regular class. The American Federation of Teachers has called for a moratorium on mainstreaming because many regular teachers feel ill-prepared to meet the educational needs of a student with disabilities. A study of approximately 800 educators in Virginia found that special educators, general education teachers, and school administrators all doubted that general education teachers had adequate preparation to make specific adaptations in instruction needed by students with learning disabilities (Houck & Rogers, 1994).

Some educators have cited another possible drawback of inclusion, that regular education teachers may compromise the instructional time they spend with nondisabled students. Unfortunately, this has only been studied directly in a demonstration school program, not in the more typical public school classroom. It was found that the regular students did not receive less instructional time in classes used for inclusion, but this study was conducted in a school described as "nationally recognized for its outcome-based education," where each fully included student had access to a resource specialist, a special education teacher, and a paraprofessional aide (Hollowood, Salisbury, Rainforth, & Palombaro, 1994).

Ideology

The "best interest of the child" standard. The goal of breaking down barriers of exclusion and bettering the lives of children with disabilities is clearly a worthy one. Yet full inclusion has been held more to a medical, "do no harm" ethical standard, than to a psychological, "best interest of the child" standard. As long as their presence is not so disruptive as to interfere with the education of other students and they themselves do not lose ground, children with disabilities have a legal right to be mainstreamed. The focus, as a result, is on "how" rather than "whether" inclusion is to benefit the individual. A "best interest" standard is thus likely to be interpreted as having current access to the mainstream, not necessarily access to services that, though segregated, may lead to more satisfactory integration later.

Civil rights. Some proponents of full inclusion draw parallels between the present inclusion movement and the school racial desegregation movement of the 1950s and 1960s—with both conceptualized as civil rights issues. In both cases, access to equal education is the goal. But just as busing was the remedy of choice for school segregation that did not always produce equal educational outcomes for different racial

groups, it remains to be determined if full inclusion will produce improved educational outcomes for children with disabilities.

Role of Research

Although research on mainstreaming and inclusion is extensive, studies to date have failed to demonstrate systematic academic advantages to inclusion over segregated special education. Yet the educational practice of inclusion and the policies promoting it are widely supported. This discrepancy between the results of research and policy-based practice is troubling, bringing to mind the parable of the naked emperor who solicits our admiration, but whom no one dares to challenge. Is the result we hoped for continuing to elude us?

Developmental research has been successfully applied in other areas of child rights law, most notably in custody law. Positive outcomes such as secure attachment, higher self-esteem, fewer adolescent behavioral disorders, and better school performance are considered to indicate satisfactory custody arrangements thought to be "in the best interest of the child." Comparable indicators are yet to be established for children in inclusion programs. Research stands to contribute significantly to our understanding of inclusion, were it to help identify the appropriate and meaningful outcomes.

History of the Policy

Legislation

Enactment. In 1975 the U.S. Congress passed Public Law (P.L.) 94-142, the "Education for All Handicapped Children Act," which mandated for the first time that all American children, regardless of any handicap, were entitled to a free and appropriate education in the least restrictive environment possible. This landmark law was followed by further legislation that bolstered the intent of P.L. 94-142, including P.L. 99-457, the 1986 "Education of the Handicapped Act," which extended services to children with handicaps from birth to 3 years of age; P.L. 101-476, the 1990 "Individuals with Disabilities Education Act" (IDEA), which renamed the 1975 law; and most recently, the "Americans with Disabilities Act," which has had a major role in expanding rights of the disabled beyond education into the work place and other public settings.

Implementation. Mainstreaming, and subsequently full inclusion, have been utilized increasingly as educational methods in the last 10 to 15 years. At the inception of P.L. 94-142, the emphasis was on creating special services, mostly segregated special education classes, so that students with disabilities would be ensured help through specially structured environments and specially trained teachers. Prior to P.L. 94-142, students with milder disabilities were frequently "included" with nondisabled peers, but without support services; children with the most severe disabilities were sometimes offered no education-based support at all. P.L. 94-142 made it clear that special services were likely to be needed to effect the guarantee of "free and appropriate public education" (FAPE) in the "least restrictive environment" (LRE).

Disparate interpretations of what constitutes full segregation or full inclusion and what should be considered the least restrictive environment have led to mixed implementation. The LRE criterion, for example, has frequently been interpreted to mean that placing a child with disabilities in a nonsegregated setting is de facto beneficial, regardless of the nature of the program or its effectiveness, given the child's age and disability.

Legal Clarification

Test cases have established wide parameters for the appropriateness of inclusion: *Oberti v. Board of Education of the Borough of Clementon (NJ) School District* (1993) established that mainstreaming is to be judged an appropriate educational method as long as the mainstreamed student does not harm or disrupt other students—even if he or she requires substantial one-on-one management in the inclusion setting. Another

landmark case, *Sacramento (CA) Unified School District v. Holland* (1994) found that as long as the student showed some improvement, mainstreaming could be considered appropriate. In this decision, there were no limitations on or expectations of how much the student could be expected to learn based on mental age, IQ, or previous rate of development.

It can be argued that the standards developed in cases like *Oberti* and *Sacramento* may not insure that the student will make as much progress as possible. For example, a preschooler with moderate mental retardation, by definition, should be progressing at approximately 50% of chronological age. Thus, if such a child were to show 3 months gain after a year of inclusion, this would be considered appropriate under the law, but the child would, in fact, be achieving only half the developmentally expected growth.

Review of Research on Inclusion

Studies of educating children with developmental disabilities in regular, mainstream settings can be divided into three types: (1) studies of cognitive skills gains made by the special education student; (2) studies of social skills gains made by the special education student, both within and beyond the mainstream setting; and (3) studies of the destigmatization of students with disabilities by nondisabled students resulting from the presence of a child with disabilities in the regular classroom. This review focuses on the first type of study, because it can be argued that gains in cognitive skills, i.e., academic achievement, represent the central purpose of school-based education. Opportunities for nonacademic socialization, social-skill building, and destigmatization can be provided by others outside school—by the child's siblings, extended family, neighborhood, day care, sports teams, social clubs, religious organizations, and community.

Studies Selected for Review

This review focuses on studies of fully included children in second grade or younger who were assessed with pre- and posttreatment measures of readiness skills, academic achievement, cognitive functioning, or language development. An initial computerized literature search of PsychInfo located over 600 citations on either "inclusion" or "mainstreaming"; a further search of ERIC yields even more. Only a small fraction of these citations, however, has appeared in peer-reviewed journals or represents reports of controlled studies. Most are chapters, position papers, project summaries, policy reports, training materials, and other non–research-based sources that theorize, describe, speculate, or advocate on the topic of mainstreaming or inclusion. Single-case studies and other case-by-case reports were not viewed as statistically powerful enough to warrant drawing meaningful conclusions for policy, though such research may describe intervention programs that are of heuristic interest (e.g., Esposito & Koorland, 1989, with N=2; Wolfberg & Schuler, 1993, with N=3). Virtually all of the studies considered span a single school year. Only one group of investigators, based at the University of Washington, has reported longitudinal data on inclusion and cognitive factors (e.g., Cole, Mills, & Dale, 1989; Mills, Dale, Cole, & Jenkins, 1995).

Overview of Findings

Although the research on inclusion, overall, has numerous methodological problems (see p. 8), the selected studies described here provide findings on various aspects of cognitive and social effects.

Cognitive Development and Achievement

Studies examining mainstreamed students with severe disabilities failed to show benefits on measures of communication and of motor and adaptive behaviors (e.g., Cole & Meyer, 1991; Guralnick, 1981) or on formal measures of intelligence (e.g., Rule et al., 1987). In studies investigating the inclusion of students with a range of disabilities, better results tended to occur for students with milder disabilities (e.g., Cole, Mills, Dale, & Jenkins, 1991; Guralnick, 1981; Jenkins, Odom, & Speltz, 1989; Rule et al., 1987). Studies testing special curricula were the only ones to produce positive outcomes (e.g., Calhoun & Elliott, 1977; Slavin, 1984), but only some measures taken in these studies showed positive effects, and the magnitude of differences was consistently modest. A lack of statistically significant differences held for studies using observational methods (e.g., Guralnick, 1981), standardized achievement testing (e.g., Jenkins, Speltz, & Odom, 1985), tests of concurrent validity with the curriculum (e.g., Cosden, Pearl, & Bryan, 1985), and intelligence tests (e.g., Cole et al., 1991).

Longitudinal studies indicated a decreasing impact of inclusion over time, but also a persistent interaction between the severity of disability and type of treatment (Cole et al., 1989; Mills et al., 1995). Students with milder impairments can benefit from an early education curriculum that emphasizes concepts (e.g., "mediated learning," in Feuerstein, Rand, Hoffman & Miller, 1980), and students with more severe disabilities are more likely to benefit from a "direct instruction" curriculum (e.g., Becker, Engelmann, & Thomas, 1975).

A recent review of research addressing developmental outcomes of inclusion of young children was prepared by Buysse & Bailey (1993). Of the 22 studies reviewed, the authors identified just 7 of young children with moderate to severe disabilities that employed standardized measures of mental development as outcomes. It was concluded that developmental outcomes did not vary as a result of segregated versus integrated educational settings. All the studies reviewed, however, had one or more threats to validity (see discussion of methodological concerns below).

Learning Factor Outcomes

Transfer of skills to new settings. Even small gains made by special education students in specialized inclusion classrooms fail to transfer to other settings or over time to later placements. For example, it was found in a recent study that fully included preschoolers with disabilities, compared to nondisabled classmates, showed greater increases in positive play, but that this difference did not persist. More positive play was not in evidence at 3- or 6-month follow-ups, nor even on the same day when the preschoolers with disabilities were given an opportunity to play with an unfamiliar playmate (Hundert & Houghton, 1992). Although the study's focus was not on social skills acquisition, the results point to the importance of generalization in skill acquisition, and whether measured gains that do not generalize across settings or time can be considered meaningful.

Modeling effects. The social learning theory supporting the move toward full inclusion and mainstreaming proposes that the child will learn more appropriate behaviors if exposed to more appropriate role models (Koegel & Koegel, 1995). It has yet to be demonstrated, however, that such learning of appropriate behaviors includes "educational behavior"—i.e., acquisition of new knowledge. In a study that examined a cooperative learning paradigm (on a reading task) in dyads with and without a learning-disabled student, the students with learning disabilities did not improve in math when paired with a typical student (Cosden et al., 1985). It can be assumed if children with less severe disabilities do not learn through structured exposure to typical peers, children with even more severe disabilities would be even less likely to do so. In fact, similar findings were obtained in a study of language development of autistic

preschoolers in segregated versus integrated settings (Harris, Handelman, Kristoff, Bass, & Gordon, 1990).

This lack of benefit from an available model might be explained developmentally, as illustrated by the role of modeling in the acquisition of play skills. Play skills tend to follow a developmental trajectory from sensory, to concrete, to parallel, to interactive and imaginative play. Younger or more developmentally delayed children at a lower stage of play are unlikely to engage in more advanced play simply through exposure to it; rather, they tend to self-represent what they see in a form congruent with their own developmental level. When exposed to curriculum content above her developmental level, a child may produce only an approximation of the mastery behavior, e.g., counting but without a one-to-one correspondence. Thus, the acquired behavior is not one that can map directly onto successful performance on a cognitive measure, i.e., to skills in addition. The behavioral model represented by the more advanced peer may nevertheless be salient to the child with disabilities in that he or she may prefer developmentally older peers who may be able to adjust and participate in less advanced activity with the child with disabilities (Guralnick, Groom, & Joseph, 1988), but it does not necessarily follow that skill acquisition is occurring.

In the case of some developmental disorders, the ability to learn through modeling may be selectively impaired. Children with autism, for example, must often be explicitly taught to imitate or model even the simplest nonverbal schemas. Until such imitation skills are acquired, these children can derive little benefit from the presence of peer models (McEachin, Smith, & Lovaas, 1993).

Social Outcomes

The role of adult facilitation. Research suggests that adult-devised activities can facilitate interaction between nondisabled and full inclusion students (Jenkins et al., 1985), but that the frequency of interactions decreases when adult support is stopped (Antia, Kreimeyer, & Eldredge, 1994). The students are likely to interact, for example, when the teacher structures contact via a buddy system or a peer-tutoring arrangement (Cole & Meyer, 1991; Esposito & Koorland, 1989). A review by Odom and McEvoy (1988) also concluded that such peer interaction works best when active adult facilitation is present. Whether it is the adult alone or a unique interactive factor of adult and typical peer together that is responsible is yet to be determined.

Peers of comparable chronological versus developmental age. The limitations of behavioral modeling notwithstanding, what other advantages may accrue to children with disabilities from interacting with typical children of the same chronological age? In an elegant study comparing play groups that combined typical preschoolers and preschoolers with delays, one group matched on chronological age, another on developmental level, it was found that although the preschoolers with delays continued to show social interaction deficits in both conditions, they preferred older peers to younger, more developmentally similar partners. They perceived interactions as more successful when they were "adjusted to" (Guralnick & Groom, 1987). Congruent with Odom and McEvoy's review, a later study found that programming social interaction among preschoolers with delays and developmentally more advanced agemates increased interactions; without special programming, the nondisabled students preferred one another to the exclusion of the students with developmental delays (Jenkins et al., 1989).

Social acceptance. Two possible negative effects of full inclusion have been a concern: (1) that special education students will not be well accepted in a mainstream setting and may, over time, be denigrated, teased, or ignored (Gottlieb, Semmel, & Veldman, 1978; Gresham, 1982; Semmel & Snell, 1979), and (2) that they will continue to be perceived as "different" even when the number of observed positive and neg-

ative peer interactions do not differ (Ray, 1985). Sociometric studies have, indeed, shown that without intervention, nondisabled students tend to prefer to play with one another, to the exclusion of peers with disabilities who also tend to stick together (Cavallaro & Porter, 1980). Full inclusion students may become less popular as the school year progresses (Gresham, 1982), but, although they may not be rated as highly accepted—even after extended mainstreaming—they also tend not to be rated as highly rejected (Brewer & Smith, 1989).

Methodological Concerns in Inclusion Research

Problems of Validity

Investigators have pointed out numerous methodological problems with research in this area, all of which threaten the validity of findings. Included are the nonequivalency of treatment groups, lack of representative settings, lack of a priori treatment-referenced outcome measures, problems with examiner bias (in that the examiner is not blind to group assignment), inconsistent implementation of procedures and curricula, and lack of documentation of the extent of student inclusion (Buysse & Bailey, 1993; Cole et al., 1989; Guralnick, 1981).

Of 22 studies reviewed by Buysse & Bailey (1993), none was free from multiple threats to either internal validity (justified conclusions) or external validity (generalizable results) or both. The studies reviewed included the type of biases that, if anything, should tend to skew results in favor of inclusion. These included studies of children in model, university-based inclusion programs (Cole, et al., 1991; Fewell & Oelwein, 1990; Jenkins et al., 1985; Jenkins et al., 1989); and studies in which it was concluded by the authors that examiners were not blind to the placement (i.e., integrated vs. segregated) of students (Cooke, Ruskus, Apolloni, & Peck, 1981; Fenrick, Pearson, & Pepelnjak, 1984; Harris et al., 1990; also others cited above).

Subjects and Matching

Severity of disability. Sampling must take into account the diversity of the disabled population. The severity of a student's cognitive disability can influence outcome and limit the generalizability of findings. Interventions designed for a student who is learning disabled, for example, may not be suitable for a student with a more severe disability (e.g., Myers, 1976). In general, children with milder disabilities can be expected to benefit more from inclusion interventions than the more severely handicapped (Buysse & Bailey, 1993).

Cohort effects. Definitions of disabilities have changed over time, and the changes in labeling can affect sample characteristics. About 11% of students qualify for some special education, with 74.2% of the 11% currently classified as specifically learning disabled or having speech or language impairments (U.S. Department of Education, 1993). In the 1970s and prior to P.L. 94-142, research focused on special education students classified as "educable mentally retarded" (EMR)—a label more stigmatizing than "learning disabled" (LD) and, at the time, more frequently used for black students. Over time, many students who would have formerly been classified EMR were subsequently identified as LD, so that a student identified as EMR today is probably more impaired than those so classified years ago ("The Mainstreaming Debate," 1989). On the other hand, the definition of learning disabled has broadened so that this group now contains students who are more impaired than those classified as LD 10 to 15 years ago.

Matching inclusion and segregated groups. Children with disabilities are seldom randomly assigned to inclusion versus segregation conditions for research purposes. Exceptions may be found in the University of Washington studies (Cole et al., 1989; Mills et al., 1995) and Johnson, Johnson, Warring, & Maruyama (1986), though these were conducted in university laboratory preschools with exceptionally high-quality resources. Without random assignment it is

important to consider whether the criteria for deciding student placement (i.e., to segregated vs. integrated settings) affects the outcome. If, for example, students with a higher level of externalizing behavior problems were more likely to be selected for segregated placement and students without such problems were more likely to be selected for inclusion, the externalizing behavior itself could turn out to be a stronger predictor of outcome than the type of classroom. Also, because educational disability categories are inexact, pre- and posttreatment measures tend to be heterogeneous within group, necessitating either the use of very large samples or careful matching of groups formed in proportion to the various types of disability present. In some studies, subjects with co-occurring sensory or physical handicaps are included, and these additional factors may independently affect the response to treatment.

The Independent Variable: Specifying the Setting and Treatment

Sampling environments. Few studies address the effects of inclusion in the typical public school classroom. Most such studies have been conducted on demonstration-quality programs specially designed to integrate special education students into the mainstream (e.g., Calhoun & Elliott, 1977; Goldstein, Moss, & Jordan, 1965; Jenkins et al., 1985). A wide range of experimental techniques has been introduced in these environments to improve effectiveness, and they have all been shown to have an impact. These include for the teacher, classroom consultation; and for the student, social skills coaching and modeling, counseling, direct reinforcement, setting up of group contingencies, and fostering cooperative versus competitive interactions. There is little evidence, however, that such methods are either widely or well implemented in the average classroom. Findings from these studies are thus limited in their generalizability to more everyday settings. In addition, the concern has been raised that few studies safeguard procedural validity—that is, that the stated curriculum was administered consistently over time (White & Casto, 1985).

Extent of inclusion. How the terms "inclusion" or "mainstreaming" are used in describing the treatment condition varies across studies and over time. Studies completed in the 1980s used the term "mainstreaming" mainly to refer to partial and full inclusion. Although some students are "fully included" and attend a regular education class for 100% of the school day, others designated as "fully included" actually spend some time in "pull-out" sessions (described below) or in a resource specialist program/room/center for remediation of specific learning disabilities. Sometimes students who are classified as receiving segregated special education are partly included for one or more nonacademic period, like lunch, recess, or physical education. It has been noted that few studies provide detailed information on exactly how "fully included" full inclusion subjects really are (Buysse & Bailey, 1993).

An integrated, mainstream setting may include just one special education student with or without a teacher's aide, or it may contain as many as half special education students and half typically developing peers. The proportion of students included may well influence qualitative aspects of the integration experience. No studies, however, directly address *degree* of integration as a continuous, independent variable with academic performance measures as outcomes.

Pull-out services. One aspect of inclusion that has been little studied is the unique contribution to achievement outcomes of "pull-out" services, used to supplement the instruction of fully included students. "Pull-outs" consist of time outside the regular classroom allocated either to specific therapy, such as speech or occupational therapy, adaptive physical education, or to more individualized contact with a special education teacher or aide, such as is found in a resource specialist program. Pull-out services, however, may not provide any more intensive or specialized instruction than that received in the regular education class (Haynes

& Jenkins, 1986). Some regular teachers whose special education students are "pulled out" express concern that the student is missing the very subject in which he or she needs remediation or that the pull-out times create such a patchwork of scheduling and partly missed assignments that even a typical student would have difficulty keeping up academically or remaining part of the social "mainstream" (McIntosh, Vaughn, Schum, & Haager, 1994).

Physical versus social inclusion. Odom and McEvoy (1988) have made an important distinction between *physical* and *social* inclusion. Physical inclusion, as they define it, involves simply placing the student with disabilities in the mainstream, while social inclusion, found to be more effective, requires that some mechanism be in place to assure contact between students with and without disabilities. Many studies fail to specify this distinction in descriptions of treatment conditions.

Specialized curricula. Research reports on inclusion programs often involve a specialized curriculum and procedures (e.g., the Classwide Social Skills Program [CSSP], Hundert & Houghton, 1992; Team Assisted Individualization [TAI], Slavin, 1984; the Adaptive Learning Environment Model [ALEM], Wang, Peverly, & Randolph, 1984), specific training for inclusion aides or the inclusion class teacher (see Hollowood et al., 1994), or provision of a resource specialist to the inclusion classroom. Outcomes of model or pilot programs may not generalize to programs without comparable resources. Buysse & Bailey (1993) noted that 70% of the 22 studies of developmental and social outcomes of inclusion that they examined were based at model program and/or university-based sites.

Comparability of curricula. In studies that compare integrated versus segregated classes, curriculum content may differ substantially, rendering between-group comparisons inappropriate. In one study, for example, in which mainstreamed first graders had higher reading levels than peers in special education, the special education group's curriculum did not include reading (Goldstein et al., 1965). Similarly, a large study of 245 3- to 22-year-old students with severe disabilities found increased social interaction, though no academic gains, among included students with severe disabilities—largely because interactions were initiated by nondisabled students who were, of course, absent in the segregated classes (Brinker & Thorpe, 1985). In yet another study, typical students in the regular education inclusion class showed more academic improvement than peers in regular education classes not used for inclusion (Slavin, 1984), suggesting that overall program quality may have been superior in the former.

Regular classroom teachers. The effectiveness of programs can vary depending on how well trained the regular teacher is with respect to disabilities (Ammer, 1984). It could be argued that teachers who become involved in pilot or model programs may be more highly motivated or highly trained than the average classroom teacher. In one study, for example, principals first nominated teachers felt to be effective at mainstreaming; this list was then validated by a special education teacher; and finally, those teachers were selected who also rated themselves as "effective" with their mainstreamed learning-disabled students (McIntosh et al., 1994). On the other hand, few studies (Fewell & Oelwein, 1990, and Rule et al., 1987, are exceptions) specify whether teachers were trained in procedures so as to guarantee uniformity in implementation of a particular curriculum.

Reliance on specialists—quality. Program effectiveness can also depend on what support services are available and how skilled the in-class instructional aide is. All too often the instructional aide has little or no prior special education or even regular education training beyond an A.A. credential in child development. In addition, schools may vary in how well they coordinate the efforts of the special education staff on behalf of the included student. Studies seldom describe such conditions in detail.

Reliance on specialists—quantity. Accurate measurement of the amount of time spent in individualized instruction with an aide is critical to evaluating inclusion effects, but none of the studies reviewed here reported the "instructional ratio," i.e., the time spent in one-on-one work with an aide divided by the time spent with the aide either absent or supervising all students in a group. And further complicating things, none has specified whether the segregated student, to whom the included student is being compared, is receiving comparable one-on-one instruction.

Process and structure. Formal classroom characteristics such as class size and teacher-to-student ratio are easily measured, but other salient components of educational process may be more difficult to assess and to compare across studies. Examples of such components include the amount of time "on- and off-task," whether the class activity is child initiated or teacher led, and whether the classroom is organized into small-group or cooperative-learning structures. All can play a significant role in operationalizing just what type of inclusion intervention is being received (Johnson et al., 1986; Leinhart, 1980).

The Dependent Variable: Measuring Outcome

What outcome is appropriate? Establishing meaningful outcome measures of inclusion presents a challenge to both educators and researchers. Public schools for nondisabled students must provide students with an opportunity to achieve a uniform set of competencies that can be measured by standardized tests of academic achievement. There is a consensus about what students should learn. Not so for students with disabilities. There is no established procedure for judging progress in a way comparable to the criterion-referenced achievement tests used for typical children. Each child's disability uniquely characterizes that child and is a major determinant of how much he or she can learn.

Identifying a priori a treatment-referenced outcome (Guralnick, 1981), like the Individual Education Plan (IEP) goals, does not necessarily protect against bias, as illustrated by one study in which students receiving higher levels of inclusion met greater numbers of their IEP goals (Brinker & Thorpe, 1984). In that the same people who set the IEP goals also made the placement decisions, results may have been affected by a desire to see inclusion "succeed."

Teacher objectivity. It is virtually impossible to conduct a study of inclusion or mainstreaming in which teachers are blind to student placement. They inevitably know which student is being mainstreamed, through the student's behavior, performance, age, or special services received. Teacher-based reports are thus subject to a variety of biases; she may be keen, for instance, to see the inclusion experiment in her class succeed. Conversely, special education teachers have been accused of favoring special education over inclusion, with special education teachers more likely than regular teachers to rate students with disabilities as needing segregated special education (Knoff, 1984). On the other hand, teachers with specialized training in learning disorders, compared to those without such training, may well be more likely to recognize what special education might offer a disabled student.

Teacher expectations and evaluation. It may also be difficult to derive valid comparisons between included and segregated or between included and nondisabled students based on teacher evaluations, because teachers may use different criteria in judging different kinds of students. Teachers may, for instance, have relatively lower academic expectations and higher behavioral expectations for a student with disabilities, and the regular teacher may confuse behavioral and educational goals when rating a mainstreamed student's achievement (Madden & Slavin, 1983). Report card grades may be officially or unofficially "curved" to reflect differing expectations for students with and without disabilities. In a study of third to ninth graders, mainstreamed special education students did "as well" or "nearly as well" as segregated special education students without special help when

the outcome of note was grades, not achievement tests (Truesdell & Abramson, 1992). In another study, cited above, inclusion was seen as successful because included students met more of their Individualized Educational Program (IEP) goals (Brinker & Thorpe, 1984)- –with IEP goals set based on expectations for the individual student.

Cost effectiveness. One dilemma facing school administrators and policymakers is the relatively high cost of special education per pupil compared to the cost of regular education. Yet few studies have included cost effectiveness as an outcome measure. An exception is Rule et al. (1987), a study of day care as a mainstreaming/special education resources model in which delivery of special services were found to cost less in a large-group, lower teacher-to-student ratio setting compared to segregated, preschool special-day classes. Another study that specifically examined instructional costs found inclusion to be less expensive than an out-of-district segregated special education program (Salisbury & Chambers, 1994).

Inclusion that requires a one-on-one instructional aide plus specialists to work with the classroom teacher to implement the IEP is likely to be costly. Whether this is the more cost-effective course, however, compared to a segregated class which might serve eight students and be staffed by a teacher and one or two aides, is yet to be determined. No study was found that compared the cost effectiveness of public segregated with public inclusion education in relationship to developmental outcomes.

Summary of Findings and Concerns about Method

Academic benefits. Research evidence documenting academic or cognitive advantages of inclusion over segregated special education is rare, and results as a whole, are unpersuasive as to the academic or cognitive benefits from inclusion. Even when students with disabilities are exposed to specially adapted curricula in an integrated setting, academic benefits are inconsistently, in fact, rarely demonstrated. In addition, potentially effective curricular components have yet to be disseminated on any national basis to more typical public school classrooms, where more valid testing of effectiveness should take place.

Social benefits. Although not the focus of this review, the possible social benefits of inclusion must be considered. Studies show that physical inclusion, whereby the student is mainstreamed without special support, or, conversely, with such extensive one-on-one assistance as to constitute a "classroom within a classroom," does not lead to increased interaction. "Social" inclusion, on the other hand, whereby adult-led or adult-structured activities encourage greater contact, can lead to increased interaction. Gains from social inclusion tend to dissipate, however, without continued adult support, and the child with disabilities tends not to generalize new skills to new settings.

Confirming the null hypothesis. Although studies have failed to identify benefits of inclusion to cognitive functioning, we have to consider that the measures may have been insensitive to differences. Perhaps the flaws in the research have introduced so much error that benefits are going undetected. Hopefully future research can repair or control some of the methodological shortcomings discussed above, but the absence of any robust findings to date make it seem unlikely that poor methodology alone accounts for the lack of positive results.

Recommendations

It would be easier to support inclusion or mainstreaming as an educational method if it could be shown to have measurable, substantial, and sustainable academic or cognitive benefits for students with moderate to severe developmental

disabilities. But this is not the case. Instead, as things stand, we are being asked to admire the emperor's garments when he has no clothes.

Do we give up on mainstreaming? Its goal—improving the quality of life for children with disabilities—is assuredly admirable. This was the intent of P.L. 94-142 and the later IDEA and it should be maintained, but other more effective means must be sought, and research should guide future policymaking. We must not confuse a short-term "fix"—placing a child in mainstreamed education—with the more far-reaching life goal of helping the child eventually function in the least restrictive environment possible.

Developmental Mainstreaming

Knowledge of child development must be brought more to bear on shaping policy on mainstreaming and inclusion. The same questions about development that apply to typical children apply to children with disabilities:

- how cognitive skills and concepts are acquired;
- how language develops;
- how the sense of self and self-esteem unfolds;
- what influence peer relationships have on development;
- what accounts for stability and durability in the development of empathy and altruism;
- how exposure to models and opportunities for social learning affect skill acquisition.

Developmental curricula. By taking a developmental perspective educators can tailor curricula to help the child with a disability move from where he or she is to the next developmental level—with emphasis on stage and a progression of skill acquisition, rather than chronological age. This is in contrast to the "functional-behavioral" approach taken by many special education specialists, which deemphasizes developmental sequence and emphasizes age-appropriate behavior regardless of degree of develpmental delay. Whereas the functional-behaviorist, for example, might have the kindergartner do an "adapted" task of scribbling a picture (along side classmates who can draw a recognizable picture), the developmentalist would be more likely to have the student drawing straight lines or circles as steps toward the longer-range goal of more controlled drawing.

Developmental placement. Inclusion, moreover, must be carried out more sensitively, taking into account the child's developmental level. One approach is to match children with developmentally similar peers for instruction in specific domains. An eight-year-old who reads at a kindergarten level, for example, should not be placed in a second-grade reading class where he is subject to being seen as the "dumbest" student, thus risking stigmatization. When put with other eight-year-olds, the child should receive supports that make the situation a "social" inclusion, not just a "physical" one—and not an academic one. Such a social inclusion may open the way to more developmentally appropriate instruction.

Matching interventions to specific disabilities. Classification of special education students, e.g., as "severely handicapped," is overly broad, compared to more careful analysis of the child's development and specific areas of deficit. For example, a child with expressive language delays may have particular difficulty in an oral reading group, an autistic child may have particular difficulty in a cooperative task, and a moderately mentally retarded child may have greatest difficulty in a team sport where reaction time counts to the whole group. Conversely, a child with an expressive language delay may do well in a computer-based cooperative math activity, and an autistic child may do well in an oral reading group. Clearly, both successful special education and successful inclusion of special education students into the mainstream must address the amelioration of specific deficits. To accomplish this, regular teachers will need guidance on each child's deficits to include him or her in meaningful ways.

Addressing stigmatization. Various developmentally oriented approaches might serve to diffuse the stigmatization that can arise when nondisabled children perceive another child as being "different" from some standard. One is to include students with disabilities with peers a year or two younger—matched to the child's developmental level. Another is to place children with disabilities in mixed-grade classes where they can join with different students on different assignments. Yet another alternative—one less favored by some proponents of inclusion, but also one little studied—is "reverse" mainstreaming, whereby nondisabled peers or slightly older "peer tutors" come into the special education setting for either academic or play activities. In such settings, adult-facilitated support, similar to that found to be effective in promoting social contact, could be applied to cognitive tasks.

Perhaps a more natural, cost-effective way to increase acceptance and decrease stigmatization is to integrate children with disabilities in nonschool settings. With most American mothers now working, increasing numbers of special education students must attend after-school day care along with regular education students. Day-care settings are more likely to have mixed-age groups and have fewer demands for cognitive performance, which, in turn, may afford children with disabilities greater opportunity to exhibit strengths.

New Directions for Research

Describing method. Few studies specify either setting or curriculum type in such a way as to allow for analysis of how these factors interact with disability characteristics and severity. Better descriptions would distinguish social from physical inclusion and developmental from functional-behavioral approaches. In one classroom, for example, we might find a student with milder disabilities reasonably able to undertake an adapted task (e.g., taking an alternative spelling test), whereas a student with a moderate to severe disability in the same situation might require virtual "classroom within a classroom" support with a full-time instructional aide. Whether or not, in addition, the teacher and classroom provide for social inclusion may well affect results for either student. Such conditions must be better described if we are to uncover what approaches are most effective for what type of child.

Parsing effects. More research is needed to identify what aspects of different educational approaches lead to positive results. For example, if a student with disabilities shows academic progress in the inclusion setting, but also receives pull-out services, to which method should the progress be attributed?

Longitudinal studies. Research on inclusion suffers badly from the lack of a longitudinal perspective. The lack of short-term benefits does not preclude that long-term benefits may accrue, but it is unclear without further investigation what these might be.

Generalizing results. Present research also suffers from the absence of designs that track the effect of possible benefits beyond the immediate setting. Research is needed to explore how gains, either academic or social, may be expressed in nontreatment settings and sustained over time, after specially structured interventions end.

Conclusions

Is mainstreaming to be a means or an end? This distinction is crucial in judging its success. If, on the one hand, it is held to be the "end," then physical inclusion of children with disabilities who do not disrupt other students can be considered a success. Current social policy and law have essentially adopted this view. If, on the other hand, inclusion and mainstreaming are to be regarded as "means," i.e., methods, their success must be measured in terms of some consistently demonstrable benefit.

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Inclusion at the Preschool Level: An Ecological Systems Analysis

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During the 1990s the public school system within the United States has stretched to respond to the diverse needs of children, families, and society. One reflection of this broadened mission is the *inclusion* of children with disabilities in educational settings with typically developing children. Also known as mainstreaming, the movement of elementary and high school children with disabilities out of special education classes into regular education has become commonplace in most school systems.

Since 1991 public school systems have been required to provide free, appropriate educational services to preschool-aged children with disabilities, beginning at age 3, with many states extending these services to children from birth. The imperative to include these young children in settings with typically developing children is in place, but numerous factors act as barriers to successful implementation of inclusion. The purpose of this report is to describe the unique nature of preschool inclusion,[1] examine briefly the empirical base underlying inclusion for young children, identify gaps in the research, and propose a conceptual framework, based on Bronfenbrenner's ecological systems model, for examining processes that support or hinder implementation of inclusion for preschool children.

Definition of Inclusion

A single definition of inclusion within an early education context is yet to be accepted. However for the purpose of this discussion, we offer a working definition that contains several features. First, inclusion is the active participation of young children with disabilities and typically developing children in the same classroom (e.g., in Head Start, public preschool, and private child care programs) and community settings. Second, services should be provided that support the child in accomplishing the goals established for him or her by the parents and a team of professionals. Third, these services are usually provided through the collaboration of professionals from different disciplines (e.g., early childhood education teachers, special education teachers, speech pathologists). Fourth, the effect of the inclusion program on children with disabilities is evaluated to determine if the child with disabilities is making progress toward goals established by parents, teachers, and other professionals. These four dimensions of inclusion emanate from the public laws that have ensured a free, appropriate education for children with disabilities (P.L. 94–142, P.L. 99–457, P.L. 102–199). It should also be noted, however,

that individuals also use the term inclusion to mean the participation of young children with disabilities in settings outside the school system, such as the community (e.g., shopping for groceries), family events and rituals (e.g., a birthday party with relatives), or church (e.g., Sunday school classes). Last, for purposes of this report the term *disabilities* refers to delays in development relative to norms of chronological age or culture, formally diagnosed conditions with associated developmental delays (e.g., Down syndrome, autism), and sensory impairments.

Rationale for Preschool Inclusion

Inclusion for young children with disabilities and typically developing children has been based on a threepart rationale (Bricker, 1978): First is that the regular education curriculum and access to a typically developing peer group will provide learning opportunities that do not exist in special education classes containing only children with disabilities (Bricker, 1995). Second, as noted above, public law recommends that, to the extent possible, children with disabilities receive a free, appropriate education in settings that are typical and that include same-aged peers. This "least restrictive environment" provision appeared in the original law that ensured educational services for children with disabilities (P.L. 94–142) and the subsequent reenactments of the law (P.L. 99–457, P.L. 102–119). Third, many individuals see the inclusion of a child in a center or class in his or her community or neighborhood as the most appropriate and ethical placement, given that it meets the child's and family's needs.

Unique Characteristics of Preschool Inclusion

Inclusion at the preschool level differs markedly from that at the elementary and high school levels. Various ingredients make the process of inclusion unique at this level: (1) the nature of preschool children's development and early childhood teaching practices, (2) organizational structures, and (3) teacher preparation.

Preschool Children's Development, Learning Objectives, and Teaching Practices

For preschool children with and without disabilities, educational objectives are most often referenced to language, cognitive, social, or motor development, or adaptive behavior. Such developmental skills are the foundation for later learning in elementary and high school classes. In contrast, educational objectives at the elementary and high school levels focus more often on basic academic skills, such as reading and math, and content areas, such as science and social studies.

Teaching practices for preschool-aged children also differ from those for older children. Accepted instructional strategies for both young children with disabilities and typically developing children encourage child-initiated learning and children's active physical engagement with each other and with the environment (Bredekamp, 1987; Wolery & Bredekamp, 1995; Wolery & Sainato, 1996). In contrast, instruction at the elementary and high school levels is more likely to be teacher-directed.

Organizational Structures

Elementary schools afford a natural setting for inclusion, where children with disabilities may spend all or part of their day in a regular education class in a public school building. Such opportunities are less available at the preschool level, because most public schools do not operate programs for 3- and 4-year-old children. To create inclusive programs, public school personnel may place children with disabilities in private, community-based preschool or Head Start programs and provide assistance from an itinerant special education teacher (i.e., a teacher who visits weekly and provides consultation).

Indeed, since 1972 Head Start has had a mandate to fill at least 10% of its enrollment with children who have identified disabilities, and at times this percentage has been as high as 13% (Ensher, Blatt, & Winshel, 1976). Providing services outside the public school setting sometimes creates administrative problems over blending funding streams, monitoring, and ensuring quality of the educational services provided (Smith & Rose, 1993). To establish such inclusive programs, public schools form collaborative relationships with private or federal agencies and establish policies for using public funds in settings outside the schools. Such administrative actions are usually not required at the elementary and high school level.

Teacher Preparation, Certification, and Salaries

Public school systems require that teachers meet certification standards established by their states. These standards usually include specialized coursework, a college degree, and supervised practicum or student teaching. When inclusive programs are operated by public schools, such requirements also exist for preschool teachers; however, as noted, in many places inclusive programs operate within private, community-based or Head Start programs. In these programs, staff may have less preservice college preparation, with training more often occurring through high school programs, community colleges, or child development associate programs of Head Start (Wolery et al., 1994).

In addition to differences in training, teachers in public schools make higher salaries than teachers in community-based preschools and Head Start. Such training and salary differences sometimes lead to conflicts when early childhood education and special education teachers attempt to collaborate to provide services in inclusive settings.

Empirical Research of Preschool Inclusion

Because inclusion at the preschool level has features that distinguish it from inclusion at the elementary and high school levels, research with older children may have limited relevance for shaping policy for very young children. Instead, empirical studies, conducted over the last 20 years, that aim specifically at exploring preschool inclusion are more helpful in understanding the process and its consequences. Although an extensive review of this literature is beyond the scope of this report, a summary of major findings follows (see Odom et al., 1996, for a more thorough review).

Educational Outcomes

Since 1980, at least four comprehensive reviews of the literature on preschool inclusion have concluded that children with disabilities enrolled in inclusive settings make at least as much progress on standardized measures of cognitive, language, motor, and social development as children in noninclusive preschool special education classrooms (Buysse & Bailey, 1993; Lamorey & Bricker, 1993; Odom & McEvoy, 1988; Peck & Cooke, 1983). Moreover, there is evidence that when teachers promote social integration, children with disabilities may make greater gains on standardized measures of language and social competence (Jenkins, Odom, & Speltz, 1989). Evidence also suggests that enrollment in inclusive programs does not have deleterious effects for typically developing children (Odom, DeKlyen, & Jenkins, 1984). Two factors that appear to influence the performance of children with and without disabilities in inclusive settings on standardized developmental measures are the type of curriculum employed (Cole, Dale, Mills, & Jenkins, 1993; Mills, Dale, Cole, & Jenkins, 1995) and the pat-

tern of age grouping, with multiage grouping being more favorable (Bailey, Burchinal, & McWilliam, 1993; McWilliam & Bailey, 1995).

Social Relationships and Patterns of Interaction

Children with disabilities, especially those with moderate and severe disabilities, spend significantly less time in interactions with their peers than do typically developing children (Cavallaro & Porter, 1980; Guralnick, 1980; Guralnick, Connor, Hammond, Gottman, & Kinnish, 1995; Guralnick & Groom, 1988; Peterson & Haralick, 1977). This consistent finding has led investigators to design classroom procedures to support social integration, which promotes interactions among children with and without disabilities. These strategies include structured integrated play activities (Odom et al., 1988), group friendship activities (Brown, Ragland, & Fox, 1988; Cooper & McEvoy, 1996; McEvoy et al., 1988), and direct support of children during ordinary classroom routines (Rule et al., 1987). When teachers directly support social integration through these and other strategies, positive changes in interactions between children with and without disabilities occur (see Odom & Brown, 1993, for a review).

Family Perspectives and Community Inclusion

Families of children with and without disabilities enrolled in inclusion settings generally have positive attitudes toward inclusion (Bailey & Winton, 1987; Guralnick, 1994; Peck, Carlson, & Helmstetter, 1992). They often report as a benefit the increased social contact between children with and without disabilities (Miller, Strain, Boyd, Hunsicker, & Wu, 1992; Peck et al., 1992) and children's increased sensitivity and acceptance of differences (Green & Stoneman, 1989; Reichart et al., 1989). When they express concerns, families focus more on teacher qualifications, adequacy of instruction, and fears of social rejection for the children with disabilities (Bailey & Winton, 1987; Hanline & Halvorsen, 1989; Turnbull, Winton, Blacher, & Salkind, 1982).

Implementation of Inclusion

Despite extensive research over the past quarter century, the knowledge base underpinning inclusion for preschool children has serious shortcomings: (1) lack of clear definition; (2) lack of studies of ordinary settings; (3) lack of attention to the role of culture; and (4) lack of a systems perspective. Were these gaps in the investigation of inclusion addressed, policymakers could be in a better position to make the critical decisions that could lead to more effective implementation of inclusion for preschool children with disabilities.

Definitional Ambiguity

Inclusion has been defined in many ways (Odom & Speltz, 1983). The absence of a standard definition impairs communication across agencies, professionals, and families. As noted previously, public law suggests some criteria for this definition, but national professional and advocacy organizations have also offered other specific definitions (e.g., DEC, 1993; TASH, 1988), while personnel in schools may operate from still a different definition (see Beckman et al., 1995). This ambiguity has important implications for researchers, in that findings on inclusion may be generated from vastly different program types and contexts. Establishing a common definition that would accommodate the perspectives of the many stakeholders in the process may be one way to help policymakers make informed decisions about implementing preschool inclusion.

Neglect of Research of Ordinary Settings

Inclusion is implemented and research conducted in a wide variety of settings. In a review of 22 studies of inclusion, selected on the basis of their methodological rigor, Buysse and Bailey (1993) noted that most of the research had been carried out in model, university-based settings. The classrooms had low teacher-student ratios, and many contained more children with disabilities than typically developing children—characteristics not typical of most child care and preschool programs operating in the wider community (Wolery et al., 1993). Such a contrast may call into question the external and ecological validity of much of the research on preschool inclusion. Moving research into more ordinary settings may well be a second way of generating information to foster better implementation.

Neglect of the Role of Culture

Given that early childhood and special education programs across the country emphasize the importance of serving multicultural communities (see Hanson, Lynch, & Wayman, 1990; Harry, 1992), and given the history of inclusion in Head Start programs, the research literature on preschool inclusion is surprisingly silent on the influence of culture. Successful implementation may well be influenced by the values associated with disabilities, family cultural practices, or the cultural "mix" or the language spoken in a classroom. In programs that are culturally diverse or different from the mainstream, culture characteristics create complex situations that can either mitigate against or facilitate the inclusion of children with disabilities. Promoting research that more explicitly examines the cultural context is yet a third way of informing the implementation of inclusion.

Neglect of a Systems Perspective

Finally, research on preschool inclusion has addressed family and administrator perspectives and program impact on children's development and social interactions among peers. Each aspect of the research provides a view of one piece of the puzzle—a single dimension of the inclusion process. Yet inclusion is influenced by a dynamic set of factors operating inside and outside the classroom. Understanding the linkages among the full range of influences and outcomes is crucial to identifying the barriers to and facilitators of preschool inclusion. For example, in assessing effects of a Head Start inclusion program, a researcher would typically document the type of curriculum used and children's engagement in learning opportunities. But the learning environment may itself be influenced by the relationships among the teachers and other professionals (e.g., special education teachers, speech pathologists) who provide services, the administrative policies relating to children with disabilities, family goals for children's participation, and cultural values of family and community members. A multidimensional approach to research is thus essential if the goal is to understand and shape implementation of inclusion for young children with disabilities.

An Ecological Systems Framework

Bronfenbrenner's (1979) conceptualization of the "ecology of human development" provides a useful theoretical framework for research on the implementation of inclusion (Guralnick, 1982; Peck, 1993). He proposed that human development is influenced by factors operating at different "systems levels" within a broad, ecological structure. These different levels exert reciprocal influences on one another, as depicted in Figure 1.

Microsystem

The first systems level, called the "microsystem," contains the factors within a child's immediate environment. These factors directly affect the child, and, in turn, may be

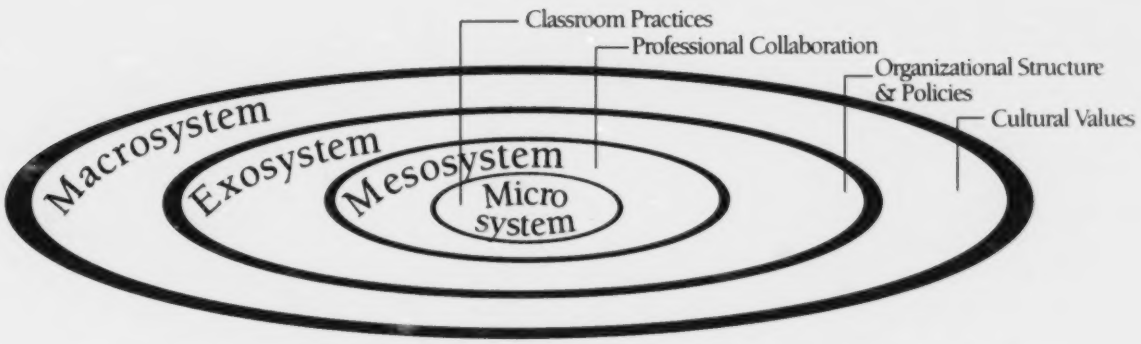

FIGURE 1. Bronfenbrenner's ecological system framework and factors affecting the implementation of inclusion

affected by the child. As already noted, most research on preschool inclusion has been devoted to identifying effects of inclusion on the behavior or development of children with disabilities, with results being attributable to practices that occur within inclusive programs (Buysse & Bailey, 1993). Other research has documented the reciprocal effects of children on the environment. In one study, teachers expressed concerns about the increased time and attention devoted to children with disabilities at the expense of attention devoted to typically developing children (Peck, Hayden, Wandschneider, Peterson, & Richarz, 1989). Other research has documented the positive contributions of preschool-aged children with disabilities to inclusive programs (Peck et al., 1992). Future research should continue to focus on the factors in the microsystem (e.g., individualized curriculum, social relationships with peers) that affect the quality of the inclusion experience for children. At the same time, however, factors operating at other systems levels must be investigated.

Mesosystem

The mesosystem encompasses "the interrelations of two or more settings in which the developing person actively participates (such as, for a child, the relations between home, school, and neighborhood peer groups)" (Bronfenbrenner, 1979, p. 25). For example, family members' beliefs about inclusion and the family's relationship with the preschool affect the inclusion process (Winton, 1993). Similarly, how children with disabilities relate to typical peers in the classroom setting may affect relationships outside class (e.g., invitations to birthday parties). Further, how professionals who serve young children with disabilities work with and feel about each other is also a part of the mesosystem.

Exosystem

Moving outward, the exosystem consists of settings "that do not involve the developing person as an active participant, but in which events occur that affect, or are affected by, what is happening in the setting containing the developing person" (Bronfenbrenner, 1979, p. 25). The service delivery agency responsible for an inclusion program provides an example of an exosystem setting. How the agency is organized, for instance, can affect program implementation. In a study that followed programs in Washington state over a 5-year period, the programs that were able to sustain inclusion services turned out to be those whose organizational structures had been reshaped explicitly to support the inclusion process (Peck, Mabry, Curley, & Conn-Powers, 1994). Other examples of factors operating at the exosystem level include the interactions of professionals responsible for inclusion programs, formal and informal policies of school systems or Head Start, and social policy that

connects organizational layers (e.g., federal, state or regional, local). Any of these exosystem factors can affect the experiences of individual children in individual programs.

Macrosystem

The macrosystem envelops the micro-, meso-, and exosystems. Bronfenbrenner defined the macrosystem as "consistencies in the form and content of lower-order systems . . . that exist at the level of the subculture or the culture as a whole, along with any belief system or ideology underlying such consistencies" (1979, p. 26). All settings at each level operate within a cultural context. The culture of special education, for example, values inclusion as a practice. Influenced over time by the movement toward "normalization" (Wolfensberger, 1972), by advocacy organizations (DEC, 1993; TASH, 1988), and by federal law (LRE provision of P.L. 94-142), many families and professionals now endorse the inclusion of children with disabilities in typical settings and everyday community activities.

Implications for Research Methodology

A program of research that examines inclusion from an ecological perspective must be multidimensional. Both traditional quantitative methods and qualitative methods are needed. Such an effort may be guided by the philosophy of Habermas (1971) and, further, by the methods of participatory research, whereby the actual consumers of research (e.g., families, teachers)

Table 1
Constituent Interest and Research Methodology

Interests	Research Questions	Methodology
Technical	What is the relationship between classroom characteristics and child behavior?	Experimental group design
		Single subject design
	Does activity-based intervention affect children's skill acquisition?	Quasi-experimental design
Practical	What are the definitions and goals of inclusion?	Interviews
		Participant observation
	How do organizational policies affect the provision of inclusion?	Direct observation
	How do characteristics of families affect inclusion in typical community activities?	
Emancipatory	What kinds of support are necessary to accommodate children with disabilities in Head Start programs?	Participatory action research
		Focused interviews
	What kinds of support for families actually result in greater community inclusion?	Participant observation

take part in the design and evaluation of the work.

Aligning Method with the Type of Knowledge Needed

A single methodological approach cannot address all types of research questions (Ewert, 1991). Different interests require different forms of knowledge, which, in turn, call for different research methodologies. Habermas (1984) separates these interests into three categories: technical, practical, and emancipatory (see Table 1).

The first interest is technical. Research questions that reflect a technical interest focus on the associations among variables, how one thing relates to or is caused by another. To this end, researchers may rely on traditional research designs such as randomized experimental group designs (Campbell & Stanley, 1963), quasi-experimental designs (Cook & Campbell, 1979), single subject designs (Kazdin, 1982), or multiple regression designs (Pedhazur, 1982).

The second interest is practical. The choice of methodology to address questions of practical interest is aimed at understanding process. For example, to investigate the process of inclusion, one could use qualitative methods such as participant observation or interviews (Fetterman, 1989), a more quantitative approach requiring a structured observation system (Carta, Atwater, Schwartz, & Miller, 1990), or a combination of both qualitative and quantitative methods (Schwartz, Staub, Gallucci, & Peck, 1995).

The third interest is emancipatory. Emancipatory interests reflect the assumption that knowledge can be used to engender changes in practice (Ewert, 1991; Habermas, 1971) and that participants are themselves directly involved in the development of this knowledge. A group of early childhood teachers, profession specialists, family members, and researchers might work together, for example, to develop a practical model, implement it, and systematically judge its effects. An emerging set of methodologies that incorporate participants serves this emancipatory interest.

Participatory Research

Educational and applied researchers have come to recognize that research participants and consumers can contribute to the development of research design and treatment strategies. Participants and consumers are well suited to judge the social importance of the goals of a program of research, strategies used in educational or clinical treatments, and outcomes (Schwartz & Baer, 1991; Wolf, 1978). It has been proposed that researchers collaborate with participants and consumers (e.g., parents, teachers, peers) to assure that interventions or treatment strategies fit the local context and that community members have the opportunity to exert some control over research that affects them (Fawcett, 1991). In the field of education, such efforts to integrate participants and consumers in programs of research are reflected in several diverse strategies.

In "market-driven research" (McConnell, Atwater, McEvoy, Carta, & Williams, 1993), the researcher's questions are aligned with the identified needs of a program or participants. For example, a researcher interested in examining strategies for promoting positive peer relationships would locate his or her study in classrooms where teachers explicitly identified this as a need.

In "action research" (Carr & Kemmis, 1986; Kemmis & McTaggart, 1988), teachers are directly involved in developing and conducting research in their classrooms. A great emphasis is placed on teachers' recognition and use of their own expertise to solve problems in their classroom; the teacher is viewed as the central change agent. The researcher's role in this process is to support the teacher's development of problem-solving strategies and to introduce methods for documenting change and its effects.

"Fourth generation program evaluation" (Guba & Lincoln, 1989) is a third example of participatory research. Following this method of

inquiry, stakeholders (i.e., the organizational layer of participants who stand to be affected by the research) play a primary role in evaluating the process and outcomes of educational programs. For preschool inclusion programs, primary stakeholders might be family members, teachers in child care centers, or teachers in the kindergarten setting where the child will attend following preschool.

Conclusion

Social policies that guide the implementation of preschool inclusion require a full understanding of the multidimensional nature of the inclusion process. An ecological systems perspective, such as advanced by Bronfenbrenner, provides a useful conceptual framework for building a program of research that could identify barriers to and facilitators of preschool inclusion. This conceptual framework pushes researchers to look closely at the type of research questions being asked, to understand how the questions are embedded within the ecological context, and to select methodologies that yield information that is not only accurate and valid, but also useful for policymakers and practitioners. Such challenges exist not just for preschool inclusion research, but also for other research related to human services that moves beyond theory and into practice.

Notes

[1]Although inclusion applies to children below the age of 3, for the purpose of this report, we will focus only on the preschool-aged group.

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A Comment on Inclusion: Research and Social Policy

John Filler

The two reports in this issue of *Social Policy Report* present very different views of inclusion. To seriously examine the research on this educational practice, we must first agree on a definition, or at least identify its unique characteristics. Then we must also consider what kind of students are being "included," what we expect to see come from this intervention, and the relative costs of inclusion versus segregated programming. Such questions must be addressed if research is to inform the making of public policy.

From Siegel's perspective inclusion is a generic term referring to the practice of placing children with disabilities in settings with regular, i.e., general education, students. Placement for less than the full day she calls *mainstreaming*; placement for the whole day is *full inclusion*.

Most practitioners and researchers would view Siegel's definition of inclusion as overly expansive and more appropriate for the term *integration*. "Integration" is the broadest term, applied to any setting that has the one simple element of contact (incidental or planned) between students with and without disabilities. "Mainstreaming" is more restricted; it refers to the specific setting where this contact takes place, i.e., the general education classroom. Neither integration nor mainstreaming involve any assumptions about either the form or intensity of services that the child with disabilities may require. Thus, just as the child in a segregated setting may lack needed services, so the integrated or mainstreamed child may not be receiving the extra supports required to address his or her unique needs.

"Inclusion," in contrast, is a term held by the special education community of researchers and practitioners to denote placement in the general education classroom *with all supports and related services called for in the Individual Educational Plan (IEP), which is provided in a collaborative model of education (with different disciplines working together)*. Inclusion is thus a *compound* treatment, not easily parsed into its separate elements.

The current array of preschool programs that serve children with and without disabilities together includes all three models: integration, mainstreaming, and inclusion. Segregated programs, with little or no contact, constitute yet a fourth, and still prevalent, model. A given program may over time reflect all four models, complicating even further our efforts to compare them.

For Odom and his associates inclusion begins with contact between students, but it also includes the services prescribed in the IEP. This definition recognizes the essential elements called for in both statute (Federal Register, 1992) and case law (*Sacramento v. Holland* and *Oberti v. Clementon School District*) and is closer to the definition proposed above. Readers must keep in mind that because the two reports define inclusion differently, it is not surprising that the authors have arrived at different conclusions about the merits of inclusion. To expand on Siegel's apt metaphor, before we ask, "Is the emperor wearing clothes?" we ought to make sure we are viewing the same royal personage.

In attempting to reconcile different perspectives, we must consider two other factors: what outcomes are of interest and which students are being included. Siegel has focused on the "academic outcomes" of children "with moderate to severe cognitive disabilities." Few proponents of inclusion (or of mainstreaming or integration)

would argue that we should expect effects to be independent of such an important factor as the child's cognitive level, especially when measures of cognition ("preacademic readiness, academic achievement, intelligence, or language") are to be the only ones examined.

Odom et al. and Siegel both cite research suggesting that children with disabilities who are in inclusion programs make greater gains on measures of social competence. Recent research involving preschool-aged children with a full scale IQ between 52 and 80 suggests similar positive results on measures of peer interaction (Guralnick, Conner, Hammond, Gottman, & Kinnish, 1996). Whether or not inclusion is found effective, therefore, depends not only on how we define it but also on what we choose to consider "effective."

Neither report has provided much discussion of the costs of inclusion relative to segregated educational programs. Given the cost conscious climate in which all aspects of public policy are debated, it is imperative that the economics of inclusion be addressed. Also the courts, one of the most important arenas in which public education policy is formed, have consistently held that cost should be considered in placement decisions. For example, in *Sacramento v. Holland*, the court found cost to be one of four determinative factors, with academic benefit, nonacademic benefit, and possible negative effects upon others constituting the remaining three.

Research bearing on questions of cost is scant. But one notable example involved a longitudinal study of the relative costs of integrated programs versus segregated out-of-district programs for special education students in a small New York town (Salisbury & Chambers, 1994). For each of the academic years from 1987–88 through 1991–92, lower per-pupil costs were achieved by integrated in-district programs compared to segregated out-of-district programs. The authors point out that at least part of those differences could have arisen from factors inherent to district demographics, not program characteristics. In addition, because the cost figures from the district providing segregated services were projected (i.e., estimated by district fiscal personnel from descriptions of students provided by the investigators), it is possible that the actual costs incurred by real students would be less.

Finally, as we struggle to understand the implications research may have for public policy, we have to acknowledge that the discussion is likely to be more significant that the conclusion. The real value of these reports lies in their capacity to stimulate new thought, not necessarily to resolve competing points of view. Public policy regarding the education of young students with disabilities will likely continue to rely on more than just the results of well-designed studies, but we must, nevertheless, continue to insist that research be an important part of the discussions determining policy.

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Update on the Reauthorization of IDEA

Editor

Attempts by the 104th Congress to reauthorize IDEA (the Individuals with Disabilities Education Act) came to a halt at the end of September, with the session's last days focused on completing budget matters. The final budget bill did increase funding for IDEA by $790.6 million to a total of $4.0 billion for FY 1997. The lion's share of the increase is devoted to grants to states for educating school-age children with disabilities (part B).

The House did pass H.R. 3268 earlier, in June 1996, but its Senate counterpart (S. 1578) did not come to the floor. New measures included in H.R. 3268 dealt with discipline, i.e., the circumstances and procedures allowing a school to expel and withdraw services from a student with disabilities, and an alternative funding formula whereby states would receive funds based on poverty rates and overall population, rather than on the number of students identified as disabled as funds are currently determined.

Inclusion was not a central concern of negotiations over reauthorization; the language on the LRE (least restrictive environment), for example, remains unchanged. Four amendments in H.R. 3268, however, have implications for the implementation of inclusion. The first requires that the regular education teacher be made part of the collaborative team deciding on the IEP (Individualized Education Program); the second requires that if a child is to be placed in other than an inclusion setting, the team must explain its decision in the IEP; the third requires that parents be made part of any team making educational placement decisions about their child. Finally, states are encouraged to adopt placement-neutral formulas for state aid to special education.

With regard to the special purpose programs of IDEA that support research, the House-passed version of H.R. 3268 would have required the U.S. Education Department to conduct a national assessment of IDEA. Such an assessment would likely include inclusion issues. Further, the Secretary of Education would have been encouraged to support research on the placement of infants, toddlers, and children with disabilities.

It falls to the next congress to take up again the reauthorization of IDEA. Presuming that the House bill and Senate counterpart will provide some of the groundwork, it is unlikely that inclusion per se will be at issue. The other measures—on discipline, funding, and refinements to the IEP—are the more likely candidates for debate.

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Building Research and Policy Connections: Training and Career Options for Developmental Scientists

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Rachel A. Gordon, Ann Marie White, and Sheri R. Wynn

RESEARCHERS IN THE SOCIAL SCIENCES have long emphasized the importance of bringing their shared knowledge and skills to bear on significant social problems. This was the vision that gave rise, in 1924, to the Committee on Child Development, and seven years later, to the establishment of the Society for Research in Child Development (Hagen, in press). Today this philosophical position is expressed in "applied developmental science." *Developmental science* refers to the study of systematic and successive change in individuals over the lifespan (Fisher, Murray, et al., 1993). This discipline recognizes the ongoing interaction between biological development and the physical and social environment. It investigates change within the individual and between individuals. Normative developmental patterns provide the basis for understanding both typical and atypical development. *Applied developmental science* pertains when the aim is not just to *understand* but to *intervene* in social problems.

As students in developmental science, we find many young developmental scientists seeking opportunities to apply developmental principles in this manner; they are interested in forging careers that blend their research training with social policy concerns. At the 1995 biennial meeting of the Society for Research in Child Development, an invited conversation hour led by several graduate students focused on the link between developmental science and social policy and the types of skills and training needed to integrate the two. Following the meeting, further conversations ensued both within this group and with exemplars in the field, professionals who are currently bridging the gap between science and policy. This report elaborates the major themes from these discussions:

(1) how developmental research can affect public policy;
(2) what skills researchers need to be effective outside an academic setting;
(3) how to acquire these skills;
(4) what alternative career paths are possible; and
(5) how academic institutions can provide opportunities for applied developmental training.

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How Research Can Affect Policy

Research on children and families has the potential to contribute to the policy process at every step of the way—through theory building, agenda setting, and informing policymaking, as well as policy and program development, implementation, and evaluation. Some brief examples are provided to illustrate how research can affect policy. (A comprehensive analysis is beyond the scope of this report; for more in-depth discussion of the relationship between research and policy, see Lorion, Iscoe, DeLeon, & VandenBos, 1996, and Shotlan & Mark, 1985.)

Theory Building

Basic research, even if not immediately applicable, can have important implications for policy. For example, the finding that sensitive, one-on-one interactions with adults are important to the optimal development of infants and young children has led to changes in thinking about day care, particularly about infant-caregiver ratios (Hayes, Palmer, & Zaslow, 1990). Theory and basic research on attachment have also been invoked in shaping school policies on classroom assignment to keep young children with the same teacher for more than a single year (Pianta & Steinberg, 1992).

Agenda Setting

Developmental research can also play a role in forming and directing a policy agenda. For example, in 1965 President Johnson's agenda for the War on Poverty was significantly influenced by events in the research community. Zigler and Muenchow (1992) describe how a relatively limited body of research suggesting the positive effects of early intervention on mental retardation sparked a media blitz and a national fascination with the possibility of increasing children's I.Q. The political climate reflected these findings. And the public also responded to mounting evidence that adverse environments could significantly impair young children's development, but that such impairments could be remediated by multifaceted intervention. These events, including a fortuitous budget surplus, helped set the stage for a large national program aimed at providing impoverished children with an enriched early environment and thus a potential "head start" in the educational system (Schorr, 1988). Bolstered by the developmental theory and research of the time, the antipoverty agenda that had previously focused on adults was expanded to include programming that emphasized the healthy development of young children.

Policymaking

A wide range of research, from case studies to analyses of population trends, has been brought to bear on the formulation of policies meant to optimize the health and well-being of children and families. The realization, for example, that characteristic burn, bruise, and scar patterns could point to the presence of child abuse spurred the social reforms regarding child maltreatment that have emerged over the past 30 years. In 1962 pediatric radiologists' original research efforts aimed at finding the "unspecified origin" of types of bone fractures appearing on x-rays (Coffey, 1946, cited in Pfohl, 1977) culminated when pediatrician Henry Kempe and his collaborators in psychiatry, obstetrics, and radiology published what became a landmark article, "The Battered-Child Syndrome" (Kempe, Silverman, Steele, Droegemueller, & Silver, 1962; see also Pfohl, 1977; Pleck, 1987). This work confidently identified parental misconduct as the cause of these injuries and spurred media reporting of the mistreatment of children (Corby, 1993; Pleck, 1987). Subsequent surveys of its prevalence, lobbying efforts chaired by pediatricians, and congressional authorization of grants to combat child abuse led all 50 states to pass, by 1967, child abuse reporting legislation (Kerns, Terman, & Larson, 1994; Pleck, 1987). In 1973, under the leadership of Senator Walter Mondale, Congress passed the Child Abuse Prevention and Treatment Act. Enacted in 1974, P.L. 93-247 established the National Center on

Child Abuse and Neglect, located within the Children's Bureau; this agency authorized federal funds to support the identification, prevention, and treatment of child abuse and neglect; and it has stimulated further federal legislation (Cicchetti, Toth, & Hennessy, 1993).

On a different scale, identifying social and demographic trends can also draw attention to policy needs. One example is the documented increase in maternal employment and public awareness of its significance for families. Interest in work and family issues (Meisenheimer, 1989) helped bring about the passage of the Family and Medical Leave Act in 1993. In demonstrating that a majority of mothers of infants born in 1987 were returning to work by their child's first birthday (U.S. Bureau of the Census, 1988), a trend that had been growing since the 1970s, parental leave advocates could rally for the initiation of federal policies to support working parents (Finn-Stevenson & Trzcinski, 1991; Hayes et al., 1990; Meyers, 1988).

Program Development and Implementation

Some lines of research explicitly inform the shaping of intervention programs (Fisher, Murray, et al., 1993; Fisher, Rau, & Colapietro, 1993). A good example, again, is Head Start. Along with a multidisciplinary group of child professionals, developmental psychologists not only provided some of the impetus to include the needs of poor children in the antipoverty platform, but also provided evidence that a quality early-intervention program must focus on the broader developmental needs of children, not solely on their cognitive skills. As a result, Head Start began and has continued as a multidisciplinary program—to include health, nutrition, and social services, as well as social and cognitive developmental components (Schorr, 1988).

Another such project-in-the-making is the Mental Health Consequences of Family Transitions to Early Childbearing Project (FTECP), more informally, the "Teen Moms Project" (Caldwell & Antonucci, in press; Caldwell, Antonucci, Jackson, Wolford, & Osofsky, in press). The Teen Moms Project is taking an intergenerational and family-systems approach to the study of adolescent childbearing, a topic of central concern to current debate over welfare reform. For example, with some states passing laws mandating that teen mothers live with their parents, it is important to investigate the ramifications of such policy decisions on the mental and physical well-being of the teen mother, her infant, and other family members. Learning more about the impact of living arrangements on psychological well-being has implications for the shaping of welfare policy.

This project also has the potential to produce relevant findings on the impact of other contextual, social, and individual factors that influence the social and mental health functioning of adolescent parents and their families—including grandparents and offspring, along with the teenager. The project's inclusion of both African American and European American families demonstrates its sensitivity to possible cultural differences in the transition to early childbearing. Among the questions being addressed is how support from friends and family may or may not protect against a range of mental health problems, including depression. The project's family-systems approach may lead to the conclusion that working with the family as a whole is more appropriate than individual counseling, a finding that would have implications for both program development and implementation.

Policy and Program Evaluation

Other research directly evaluates social programs and public policies, specifically to determine how well a program or policy is working and why (Fisher, Murray, et al., 1993; Goldstein, Wilson, & Gerstein, 1983). One such study addressed the effects of mandated special education services under the Education for All Handicapped Children Act (P.L. 94-142). Of interest was whether special education students were retaining their classification when they moved from one school district to another; it is

well established that such a classification can have lasting effects on a child's overall educational experience (Singer, Palfrey, Butler, & Walker, 1989). Researchers were able to predict, for each of the five American cities sampled, which classification students were likely to receive were they to move to any of the other four districts. While the percent of students who retained their original special education category varied by home district and by original classification, overall, those originally classified as emotionally disturbed and mentally retarded were the most likely to be given a different special education classification if they moved, while those labeled as hearing impaired were the most likely to retain their classification if they moved. Special education classification policy was found to be inconsistent across school districts (Singer et al., 1989).

The New Chance demonstration provides a more recent example of research being brought to bear on a social program. New Chance is a two-generation program specifically targeting young mothers aged 16 to 22 who are both high school dropouts and recipients of Aid to Families with Dependent Children (AFDC). Designed and managed by the Manpower Demonstration Research Corporation, this program provides comprehensive, integrated services, including adult education and GED preparation, job training, life skills instruction, parenting education, child care, family planning, and other health services such as pediatric care. Approximately 2,200 families have been randomly assigned to treatment and control groups in 16 different research sites. Families will be followed for a period of 3 years. Outcomes to be assessed include parents' education and employment status, parenting and the parent-child relationship, children's health and development, and a cost-benefit analysis of program implementation (Quint, Musick, & Ladner, 1994; Smith, 1995). This initiative marks one of the few attempts to evaluate the effects of such a program on the lives of children, and not just adults.

Skills Needed by the "Policy" Researcher

Graduate training in developmental science prepares us in two crucial areas: (1) research methodology and (2) substantive knowledge about children and families. This expertise is requisite to the pursuit of a career aimed at bringing science to the policy process—whether through research, program development, philanthropy, advocacy, or public service. Generally, academic programs prepare students to examine issues from several perspectives, to evaluate research results in terms of methodological rigor and empirical significance, and to critically assess findings from large bodies of research—all essential skills, regardless of one's particular career aspirations.

But what other skills must we acquire to be effective? Two areas not typically addressed in many graduate programs are (1) how to formulate research in a way that is useful in the policy arena and (2) how to communicate findings to nonacademic audiences, namely, to policymakers and to the public.

Formulating Policy-Relevant Research

Asking pertinent and timely questions. Framing questions to make research useful to the policymaker is a first step. Although *descriptive* research, which characterizes an aspect of development or a context at a point in time, can yield rich information, it may fail to show how development can vary in different contexts. *Explanatory* research, on the other hand, focuses on how patterns of development may change depending on individual differences and the context. In this case, the researcher introduces variation or capitalizes on naturally occurring variation (considered *intervention* research [Lerner, 1995]). Such studies can offer a greater level of specificity that may better fit the needs of policymakers.

An example of explanatory research is the evaluation of the Resolving Conflict Creatively Program (RCCP), a comprehensive school-based

program focused on reducing violence and increasing caring and cooperative behavior among students in grades K to 12. Begun in 1985, RCCP came about through a collaboration between the New York City Board of Education and a nonprofit organization, Educators for Social Responsibility–Metro, now one of the largest and longest-running school-based conflict resolution programs in the country. RCCP was one of 12 programs funded by the Centers for Disease Control and Prevention as part of an initiative to identify and formally evaluate youth violence intervention programs. The evaluation of RCCP includes a sample of approximately 9,000 elementary school students attending 15 schools in four school districts in Manhattan and Brooklyn (Aber, Brown, Chaudry, Jones, & Samples, in press). Data have now been collected from students and teachers at four different times over a 2-year period.

A central question guiding the design of the evaluation was how the effects of RCCP on children's cognitive and behavioral development as it relates to aggression and violence are moderated by other child and context factors—namely, intensity of intervention, developmental stage of child, children's sociodemographic characteristics, and classroom, school, and neighborhood composition. Such findings are particularly salient to policymakers. Insights into program effectiveness—for children of different ages, racial and ethnic backgrounds, economic status, and schools and neighborhoods—have implications for decisions about cost and where and when to intervene.

The timing of a study is also important. The researcher must be aware of the policymaker's needs and anticipate the kinds of information that will be most useful. For example, the Children's Television Act, passed by Congress in 1990, specifically requires television stations to provide educational programming for children and to document their educational programming in the renewal application. "Educational programming," however, is left undefined, and no standard definition exists in the industry. Anticipating the industry's response to this loophole, Dale Kunkel, who testified before house and senate subcommittees and advised legislative staff on the Children's Television Act, investigated what he called the "re-label hypothesis." Kunkel predicted that TV stations, lacking an industry-wide standard defining "educational programming," would re-label some entertainment programs as educational. A survey of license renewal applications revealed, as predicted, many frivolous claims to educational programming (Kunkel & Canepa, 1994; Kunkel & Goette, 1996), thus highlighting the need to incorporate more explicit criteria for what constitutes educational, versus entertainment, programming in future efforts to improve children's television.

Making judgments about usefulness. It is one thing to link research and practice conceptually, another to acknowledge the limitations of relevant data. Various criteria are used in judging the adequacy of research for informing policy—for instance, whether findings are consistent across different samples or methodologies, or whether researchers reach consensus on a given issue. Researchers must, in addition, balance their conclusions against the social, political, and economic pressures faced by the policymaker. Such considerations demand a high level of flexibility.

Past and present dialogue on the consequences of day care for children's healthy development illustrates some of these tensions. Early research on the effects of day care on infants, particularly of extensive day care use during the first year of life on the mother-child attachment relationship, was inconclusive. Findings were controversial in light of the economic reality that necessitated, and still does, increasing involvement of women in the work place. Given the important scientific and policy implications of these findings, the National Institute of Child Health and Human Development (NICHD) initiated a longitudinal, multisite study to resolve questions about the effects of day care. Of interest is how variations in child care experience,

family characteristics, and child characteristics affect the social, emotional, cognitive, linguistic, and health outcomes of children. This comprehensive study is being conducted by 24 investigators who represent a variety of perspectives.

Results to date based on measures taken at 15 months have recently been made available. Analyses reveal no relationship between infant day care experience and mother-child attachment, except under conditions of "dual risk," e.g., insensitive mothering combined with poor-quality day care (NICHD Early Child Care Research Network, in press). Given the significance of these findings for the nation's families, however, the research team is continuing to examine other domains of the children's development and to follow them over time as they grow older.

Communicating Findings to a Nonacademic Audience

Clarity, brevity, and everyday language. Most graduate programs do not emphasize concise or jargon-free writing. We are given little practice, for instance, in quickly preparing brief memos and executive summaries, or in writing for nontechnical audiences—skills one needs for effective communication with policymakers and the public at large (Huston, 1994). Most writing in our field is aimed at a limited professional audience, but an exception recently found members of the Society for Research in Child Development, the Society for Research on Adolescence, the International Society for Infant Studies, and Division 7 (Developmental Psychology) of the American Psychological Association collaborating on a series of "research briefs" targeted at a broader audience. The briefs focused on topics of current policy interest about which our field can offer strong research findings. The specific topics included adolescent childbearing, child care, child nutrition, and the consequences of poverty for children and families. The briefs were disseminated to the staff of programs serving children, program evaluators, funders, policymakers, and the public at large through the media.

Capturing subtlety without detracting from the main point. Developmental scientists are taught to be critical of the content, process, and interpretation of research, and how to go about evaluating conflicting findings or rival hypotheses (Zervigon-Hakes, 1995). In contrast, policymakers typically need definitive answers and a concise summation of facts. Zigler highlights this contrast when describing a congressman's response to a researcher's testimony: "What this country needs is a one-armed psychologist. You guys are always saying 'on the one hand . . . but on the other hand'" (1993, p. 11). Presenting information without a clear and definite message risks failure. Scholars experienced in the policy arena emphasize the importance of tying together the most advanced thinking on a topic and framing it in a way that is optimally informative.

The press release of the most recent findings from the NICHD Study of Early Child Care (National Institute of Child Health and Human Development, 1996) and the subsequent report by *The New York Times* provide a good example of how a controversial issue can be presented in a comprehensive, balanced, and yet conclusive manner. The reporter first established the relevance of the research on maternal employment to the public, then clearly described the findings to date, giving the competing views on the topic and how the findings help resolve previously unanswered questions (Chira, 1996).

How to Acquire Additional Relevant Skills

The applied developmental scientist venturing into the policy world can gain relevant experience through a variety of channels—some within the academic community, others outside,

in interdisciplinary graduate programs and in real-world policy settings.

Interdisciplinary Training

The applied developmental scientist's activities may require skills from several disciplines, including psychology, demography, political science, economics, and sociology. To this end, various interdisciplinary research centers have created training opportunities for the interested student to acquire broad-based proficiencies in different disciplines. Some institutions provide for the student to earn concurrent or combined research and professional degrees (Box 1).

BOX 1

Concurrent and Combined Degrees

➢ The University of Alabama at Birmingham offers a concurrent program in developmental psychology and maternal and child health, whereby the student develops the skills to put "research into practice" in a public health agency and earns a master's degree in public health and a Ph.D. in developmental psychology.

➢ The University of Nebraska at Lincoln offers predoctoral and postdoctoral programs in psychology, mental health law, and policy. Predoctoral students may pursue a master's degree in arts or legal studies (M.L.S.), or a J.D. or Ph.D. Postdoctoral scholars typically complete an M.L.S. degree. The psychology, mental health law, and policy programs are NIMH-funded positions geared toward students with mental health law interests.

Others offer flexibility in program planning that allows the student to gain expertise in a range of disciplines (Box 2). Still others may encourage interdisciplinary training by providing courses that cut across programs or by granting a leave of absence so students can gain experience in a related field.

BOX 2

Alternative Curricula

➢ The Irving B. Harris Graduate School of Public Policy Studies offers year-long fellowships in child policy which build on previous graduate training by providing experience in policy analysis and management, leading to a master's degree in public policy.

➢ In the Pew Health Policy Program at the Institute for Health Policy Studies, University of California, San Francisco, postdoctoral and mid-career scholars receive multidisciplinary training through a curriculum in health policy and supervised work within an ongoing health policy research project.

Real-World Experiences

Real-world experiences serve the emergent applied developmental scientist in a number of ways: by affording opportunities to "test the waters" and explore different policy areas, by introducing and fostering the learning of the skills most valued in policy settings, and by providing a "foot in the door" to long-term policy work. Gaining real-world experience with a well-versed mentor in a relevant setting is invaluable to the student aspiring to do applied work.

Voices of experience. Several of our "informants" reported that while their graduate training gave them a critical grounding, they benefited greatly from on-the-job training. One such story came from Dr. Marty Zaslow, currently a consultant with Child Trends in Washington, DC. As she explains it, it was only when she began actively distilling a policy-related research literature as a staff member at the National Academy of Sciences (on children's response to the stresses of maternal employment) that she began to understand the kinds of research that were truly useful in the policy process. It was then too that she came to recognize the impor-

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tance of translating and presenting findings in a way that is accessible to nonacademics.

Another example comes from Dr. Martha Moorehouse, senior research and policy analyst for the Office for the Assistant Secretary for Planning and Evaluation in the U.S. Department of Health and Human Services. Dr. Moorehouse recounted how mentors fostered her interest in the intersection between work and family life, but she credited her experiences as an SRCD Executive Branch fellow in the Administration for Children, Youth, and Families with providing her with some of the public administration and policy skills needed to bridge the gap between research and policy. She also emphasized the importance of gaining experience with program intervention, i.e., the implementation stage of policymaking. That kind of experience, she maintained, is invaluable if connections between knowledge and practice are to be made.

Dr. Mary Larner, issue editor of *The Future of Children*, published by the Center for the Future of Children at the David and Lucile Packard Foundation, recalls seeking real-world applications for her graduate training in human development; she worked for several years as a direct provider of early child care services, then as a research associate at the High/Scope Educational Research Foundation focusing on family support. Later work conducting policy analysis in the area of early child care and education at the National Center for Children in Poverty kindled her interest in using research as a tool to inform and shape policy. Currently, Dr. Larner combines her academic skills, her field-based service delivery experiences, and her knowledge of policy analysis in her work as an editor of a foundation-based journal created specifically to influence child policies. She draws heavily on her research background to critically analyze and evaluate the scientific rigor of studies on specific policy-relevant topics. Then she synthesizes and translates significant findings in a way that is comprehensible and useful to audiences that may lack technical expertise, such as policymakers, legislators, practitioners, and other professionals in the public and private sectors.

Judging from the experiences of those we interviewed, we conclude that practical work experiences that build on graduate training provide the best preparation for careers that combine research and policy. Such experiences can be sought through formal and informal avenues. The formal route provides the advantage of entering an existing infrastructure which may facilitate a later transition to policy-related work; at the same time, access can be highly competitive. A more informal route may lead the applied developmentalist to a tailored position fit to his or her particular expertise and interests; at the same time, locating such a situation requires considerable initiative.

Formal opportunities. Although formal programs are limited, many scholars have received their early experiences through such formal internships and fellowships (see Appendix). While some programs are more general, several are tailored specifically to child and family policy. Most offer some formal curriculum—e.g., orientation to the policy arena, seminars, and mentoring. They are located in both the public sector—at federal, state, and local levels (Boxes 3 and 4)—as well as in the private sector (Boxes 5 and 6 on page 10).

Informal opportunities. Participating in informal settings, e.g., working in a local social agency, school setting, political campaign, can round out and fill in the gaps between formal training opportunities. Although entry level situations are typically low-paying, if not volunteer, informal experiences can afford valuable exposure to policy-related activities.

Alternative Career Paths for the Applied Developmental Scientist

Scholars with expertise in applied developmental science have found professional niches in a wide range of settings—in foundations, in for-

BOX 3

Formal Opportunities at the Federal Level

➢ The American Psychological Association offers Congressional Fellowships to postdoctoral and mid-career scholars. Fellows assume a placement in a congressional office, assisting the staff of a member of congress or congressional committee. Their responsibilities may involve assisting with legislative work, organizing hearings, and helping to prepare speeches and briefings.

➢ The Society for Research in Child Development Executive Branch Policy Fellowships in Child Development place mid-career fellows as resident scholars in executive agencies, such as the Administration on Children, Youth and Families (ACYF), the National Institute of Mental Health (NIMH), and the National Institute of Child Health and Human Development (NICHD). Former fellows coordinated a national evaluation project for Head Start, represented the ACYF on the Institute of Medicine's Panel on Prevention of Mental Illness, and helped oversee an Interagency Research Committee on child abuse and neglect.

➢ The Student Educational Employment Program is an umbrella program providing undergraduate and graduate student placements in the executive branch of government. Additional programs are maintained by individual government bodies, including the Congressional Research Service/Library of Congress Volunteer Internship, Department of Labor's Job Corps Internships in Academic and Vocational Education, the U.S. Supreme Court Judicial Fellows Program, and the White House Fellowships.

profit and not-for-profit organizations, in state and local government, and within universities. A recent follow-up of 60 Congressional Science and Executive Branch fellows sponsored by the Society for Research in Child Development since 1978 (under the American Association of the Advancement of Science) found more than half employed in nonacademic settings. These run the gamut from the Carnegie Foundation, to the Child Welfare League, to the New York State Housing Bureau, to NICHD, to the House Ways and Means Committee. Some occupy positions

BOX 4

Formal Opportunities at State and Local Levels

➢ The Putting Children First program at the Center for Young Children and Families, Teachers College, Columbia University, provides summer fellowships for doctoral students interested in working on a policy-relevant project in either public or private New York City or State agencies. Placements have included the Child Welfare Administration, the Family Court, Children's Defense Fund, and the Foundation for Child Development. One day a week, fellows gather to attend invited lectures by leading policy scientists and practitioners, to share placement experiences, and to present policy papers.

➢ New York City offers two long-standing programs, the Urban Fellows Program at the post-undergraduate level and the Government Scholars Program, in which undergraduate students combine full-time work in a selected policy placement with an orientation to city government and an ongoing seminar series.

➢ In the National League of Cities' Project on Children and Families in Cities, graduate students assist municipal officials in taking action on behalf of children and their families through hearings and technical assistance visits.

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BOX 5

Private Sector Support for Young Scholars

➢ The Center for Law and Social Policy's Research Fellows Program in Washington, DC, targets recent college graduates contemplating law school or graduate training related to family policy, providing them with practical experiences, such as monitoring congressional hearings and preparing newsletters and reports.

➢ The Jane Addams Fellowships in Philanthropy at the Center on Philanthropy at Indiana University provide recent college graduates intensive study of the theory and practice of philanthropy, as well as opportunities to engage in the nonprofit arena within or outside the Center.

➢ Through the Brookings Institution's Research Fellowship in Governmental Studies, doctoral candidates conduct policy-relevant research related to their doctoral dissertation. Fellows have access to data and consultation with senior staff members at the Institute and to other policy opportunities in Washington.

➢ Through the Families USA internship program, undergraduate students and recent college graduates work in a variety of media, governmental affairs, and field settings. Media interns, for example, monitor news broadcasts, write "Health Facts" (a column for nationwide publication), and assist in the preparation of press alerts and conferences.

within university units that are expressly devoted to policy-related research and training, e.g., the Irving B. Harris Graduate School of Public Policy Studies at the University of Chicago and the Center on Children, Family and the Law at the University of Nebraska (Thomas, 1996). Such settings offer abundant opportunity to practice applied developmental science.

FOUNDATIONS

Early philanthropic foundations arose in part out of an interest in using science to identify and eliminate the causes of social ills (Cahan, 1986). Foundations whose mission is to improve the well-being of children and families rely on a strong knowledge base, provided in many of the larger foundations by staff members with developmental training and/or technical research expertise (Zervigon-Hakes, 1995). Foundations also play a major role in fostering

BOX 6

Private Sector Support for Advanced and Mid-Career Scholars

➢ The American Psychological Association (APA) oversees internships offered by APA and the Society for the Psychological Study of Social Issues. Graduate students and postdoctoral scholars work in the APA Public Policy Office, participating in legislative and advocacy work such as preparing testimony and briefing materials or analyzing social policies.

➢ Child Trends' Scholars in Washington Program aims to increase interaction between scholars and federal policymakers working in areas related to children, youth, and families. Early- and mid-career scholars work on their own research and joint projects of mutual interest with Child Trends staff.

➢ The Annie E. Casey Foundation's Children and Family Fellowship supports mid-career professionals while they work on projects, engage in field experiences, interact with Casey Foundation staff, and participate in seminars at the Robert F. Wagner Graduate School of Public Service at New York University.

ties between academic research and the policymaking process. Several foundations (William T. Grant Foundation, Foundation for Child Development, and Ford Foundation, to name a few) serve as hubs for connecting researchers, policymakers, and program practitioners. As Dr. Lonnie Sherrod, vice-president of programs for the W. T. Grant Foundation, states, "We try to bring research information to the policy table and bring the needs and questions of the policy arena back to the research community."

Foundations often anticipate the policy horizon and promote needed research. For example, in the late 1980s a set of interventions for mothers and children emerged (e.g., New Chance, JOBS Child and Family Outcome Study, Teen Parent Demonstration). These interventions represented different approaches to helping families move from welfare to work through the provision of supports for children (e.g., child care) as well as supports for parents (e.g., parenting classes, job training). A group of foundations, including the Foundation for Child Development, the W. T. Grant Foundation, Smith Richardson, and the Rockefeller Foundation, viewed these interventions as a new genre of services for families and promoted study of their impact on mothers and children. The foundations seized the opportunity to learn about how to most efficiently glean information from these large-scale, interdisciplinary studies that combine survey methods with smaller, embedded studies of parenting and children's development. One foundation took the lead in initiating formal discussions among researchers and other interested foundations to identify the questions most in need of further investigation and to promote funding for evaluation.

Foundations also support the dissemination of research findings beyond the academic community. For example, the David and Lucile Packard Foundation established its own journal entitled *The Future of Children*, geared to audiences of national leaders, policymakers, practitioners, and other professionals. Some foundations fund organizations that inform the voting constituency, such as National Public Radio. Others fund organizations that provide information, set directives, and propose projects for governmental bodies, such as the National Health Policy Forum, the National Governors' Association, the National Conference of State Legislatures, and the National League of Cities. Still others fund advocacy organizations, including state and local child and antipoverty organizations that distill research for public use by lobbyists, lawmakers, and others.

The Annie E. Casey Foundation supports information dissemination groups that track and analyze policy and applied research information. The Carnegie Task Force on Meeting the Needs of Young Children exemplifies another strategy whereby the foundation assumes the responsibility of convening a task force and disseminating resulting reports (Carnegie Task Force on Meeting the Needs of Young Children, 1994).

"Think Tanks"

Organizations that are independent of both academia and government, and which conduct policy analyses and policy relevant research, are typically referred to as "think tanks." Examples include the Search Institute, located in Minneapolis; the Families and Work Institute, based in New York City; and the Manpower Demonstration Research Corporation (MDRC), located in both New York City and San Francisco.

Often dedicated to a particular issue (e.g., poverty, race, sociodemographic trends) or a particular population (e.g., youth), think tanks represent another venue where developmental training is useful. Although some of their activities may resemble those pursued by academicians, such as grant-writing, conducting research, and presenting and publishing results, think tanks are likely to also be engaged in translating findings for professional and lay audiences, designing and conducting evaluations for community-based organizations, and fostering collaborations and discussions among groups regarding programs, research, and policy, all with the overriding goal of making information

more accessible. Although these organizations may provide excellent opportunities to conduct both basic and applied research, they are primarily funded through "soft money" and thus lack the security of an academic setting.

The Search Institute has a broadly defined mission of bettering the lives of children and youth. Examples of its recent activities include conducting a statewide survey on the features of communities that help build resiliency in youth, evaluating the national 4-H program, and organizing a pre-conference session on community research and the implications for adolescents at the Society for Research in Adolescence's recent meeting in Boston.

The Families and Work Institute focuses on the relation between work and personal life, and has most recently conducted a study on the quality of family child care. Currently it is heading a public education campaign targeted at understanding the first years of life; it is also conducting the second stage of a longitudinal study of the changing American workforce.

MDRC designs and field-tests education and employment programs that target disadvantaged youth and adults. It seeks to improve public policies and programs by providing policymakers and program practitioners with research demonstrating the effectiveness of social programs. MDRC is currently evaluating the Job Opportunities and Basic Skills Training (JOBS) program established by the Family Support Act of 1988, as well as several other welfare-to-work policies, including an early cross-state evaluation of time-limited welfare implementation.

Local, State, and Federal Governmental Organizations

Local, state, and federal governments differ in their purpose and functioning, and these differences afford a variety of career options within government. Federal policy, compared to state or local policy, focuses on the level of investment rather than on how to adapt a policy to particular constituents. Thus, the federal policymaker must wrestle with questions like: Should money be spent at all? To whom should it go first? The Office of Planning and Evaluation at the Department of Health and Human Services provides guidance to the secretary of DHHS on policy development and evaluation within the full range of human services, including child and youth policy, economic issues for families such as welfare, health policy, and long-term care and disability.

At the state and local levels, the policymaker is more likely to be engaged in "fine tuning" an already existing federal or state policy. Such activities may include developing and selecting the most appropriate program for constituents, e.g., whether one curriculum or another is to be used, or reacting to or planning for federal policy changes. The focus is on implementation.

This distinction between local, state, and federal roles is becoming increasingly important as the federal government downsizes and as jurisdiction over social services, such as welfare, is being shifted from the federal government to the states. New career paths may open up to accompany the changes. With increased flexibility afforded by new block grants, states may well find themselves in need of expert advice from those who can help identify implementation and evaluation goals—i.e., what questions to ask, which data are most realistic and valuable to collect, and how information can enhance states' effectiveness.

Developmental scientists have a variety of potential opportunities to apply their skills in local government agencies. In 1991, for example, Minnesota established a governmental commission called Action for Children that functioned under the auspices of the state planning agency. Similar to the National Commission on Children and its report *Beyond Rhetoric* (1991), Action for Children conducted a statewide survey of the needs of children and families and published its findings in a report entitled *Kids Can't Wait: Action for Minnesota's Children* (1992), and made recommendations to the state aimed at strengthening opportunities for children and families. Another example is Agenda for

Children Tomorrow (ACT) of the Administration for Children's Services of the New York City mayor's office. This initiative focuses on research-based program planning, design, and implementation to enhance neighborhood-based family and children's services.

Some Cautions

The path between the world of research and the world of policies and programs tends to be indirect (Hanushek, 1990). According to our informants, moving between research and policy settings can be far from smooth. Lines of communication between researcher and policymaker are often tenuous; even when a researcher is called upon to give expert testimony before Congress, the actual effect of such input is difficult to measure. All too often the academic and policymaker occupy separate worlds, with little cross-fertilization. They may view each other with misapprehension or even suspicion, each being unfamiliar with the content, language, communication style, and demands of the other's discipline. Perhaps we can not expect to change the policymaker, but we as developmental scientists can break through these barriers by expanding our interactions with policymakers and by augmenting our learning in relevant areas, e.g., in law, economics, political science, etc.

The academic who wishes to be active in both academic and policy spheres faces significant challenges. To begin with, neither setting inclines to offer rewards for participation in the other. It is suggested that the goal of bridging the two may be best accomplished by first establishing oneself as a solid researcher before attempting to enter the policy world. Having credentials and some public identity as an authority in a particular discipline will make it easier to enter the policy arena. In the reverse, for one who intends to return to academia, it may be important not to become too entrenched nor to stay too long in a policy setting. Positions that allow for or require continued publishing, contact with academic colleagues and students, and proximity to the active practice of social science can protect against possible loss of credibility.

Creating Training Opportunities: Suggestions for Academic Departments

At the same time that the field of applied developmental science is becoming more visible (Fisher, Murray, et al., 1993; Zigler, 1980), students perceive the prospects for traditional academic careers to be dwindling. As a result, academic programs face increasing demands to provide students with course work and experiences that will prepare them for alternative careers. The response is varied (Fisher & Koocher, 1990). Some universities have already created separate programs in applied developmental science or applied specializations within existing programs (see Fisher, Rau, et al., 1993; Fitzgerald, Abrams, Church, Votruba, & Imig, 1996). Others are just beginning the process of making applied training available to undergraduate and graduate students.

Without requiring massive restructuring of teaching or programmatic requirements, departments can take some preliminary steps toward meeting the needs of students with applied interests. Steps will likely involve exploiting and redefining current opportunities as well as creating new ones. Listed below are some suggestions, from the perspective of those still in training, for how academic departments may foster applied developmental research, course work, and experiences. These recommendations reflect increasing degrees of commitment and formal structure on the part of students and academic departments.

Discussion groups. Students themselves can arrange informal groups to discuss current events of interest to developmental scientists, relevant courses, possible training and internship opportunities, and ways for sharing developmental knowledge with their local community.

Invited speakers. Expert talks or lectures, in informal bag lunches or more formal colloquia, can expose students to applied developmental issues and methods.

Volunteer experiences. Students can volunteer, as individuals or as a group, to share their developmental knowledge and skills with community or governmental organizations. One might, for instance, help develop activities for a local day care or facility for the elderly, serve as a volunteer guardian ad litem or court-appointed special advocate for children involved in child abuse and neglect cases, or serve as consultant to private or governmental organizations that affect the lives of children and families, e.g., to a school, a children's museum, or local legislator.

Field experience courses. Giving course credit for field experiences is an effective way to help students broaden their experience in the community. Such courses may range from community service work to more specialized research or evaluation projects designed to meet the needs of a particular organization or program.

Internships within other institutions. Departments can alert students and encourage them to participate in applied developmental training experiences offered in other settings outside the university. Source books and world wide web sites listing a wide range of opportunities can be found in the Appendix.

Inter-departmental courses. Students can be encouraged to take relevant courses in other departments, for example, in sociology, law, public health, social work, public policy, family studies, political science, statistics, economics, and even less obviously related disciplines such as geography, architecture, engineering, and marketing—any of which may be useful to the well-rounded applied developmental scientist.

Formal curricular offerings in-house. Departments of psychology may establish applied developmental courses within the department, such as a seminar focusing on research and policy, or courses designed specifically to provide training in policy, communications, ethics, methods, or statistics. Instructors for such in-house courses should ideally come from a range of disciplines, so that students are exposed to different perspectives.

Research projects and theses on applied developmental issues. In addition to providing course work and field experiences, departments may encourage students to focus their master's and dissertation research projects on applied developmental issues; they may consider accepting theses which analyze existing data derived from community or governmental research projects or well-designed program evaluations.

Funding and grants. Funds from within the university or from private foundations or corporations may be sought specifically for the purpose of supporting applied developmental students, applied developmental research, and field placements.

New faculty. Departments may seek to hire faculty with interest and expertise in applied developmental science to teach and supervise students with like interests. Faculty with established ties to the policy world stand to offer important guidance to students with applied interests.

Not all of the options will be appropriate for every department. At least some, however, are likely feasible within most departments and may go a long way toward satisfying the curiosity and needs of students interested in pursuing careers in applied developmental science.

Conclusion

Recent evidence suggests that the field of developmental science is itself developing, growing to include an emphasis on the application of developmental principles and methods to practical social problems. It can be seen in the national dialogue regarding a set of training criteria to be used by graduate schools interested in forming an applied developmental science program or an applied specialization within a department (Fisher, Murray, et al., 1993). It can be seen in the actual formation of such training

programs and specializations (Fisher, Rau, et al., 1993; Fitzgerald et al., 1996). And it can be seen in the newly created forum for the dissemination and debate of current research in this growing field, a journal entitled *Applied Developmental Science* scheduled to release its first issue soon. The attention to and formalization of graduate training, and the launching of a professional forum for communication, suggest a growing recognition that applied developmental scientists can, should, and will play a greater role in addressing real-world problems.

While there are numerous settings in which our knowledge base of developmental science and scientific methodology may be brought to bear, having the opportunity to apply this knowledge within traditional policy positions may take some time. However, given the range of training options and the considerable variation in career opportunities highlighted in this report, developmental scientists who wish to use their skills toward improving the lives of children, youth, and families can follow many paths. As one of our experts said, "If you're interested in social issues for children, it's hard to not want to be in a context where you work on important social issues of our time."

Appendix

Locating training and career opportunities of interest in academic, government, nonprofit, and private settings can be challenging. Below are several resources to guide graduate students and junior faculty seeking information about opportunities across a variety of settings.

➢ For information about particular academic programs:

Peterson's Guide to Graduate Programs in the Humanities and Social Sciences (Peterson's Guides, 1995)—profiles child and family policy training at public policy schools, social work schools, and applied developmental science programs, and particular disciplinary associations such as the Association for Public Policy Analysis and Management (APPAM) and the Council on Social Work Education (CSWE).

➢ For information about organizations outside academia that are dedicated to policy, advocacy, and information dissemination regarding children and families:

Directory of Organizations Concerned with Public Information of Relevance to Children (Rosenberg & Sherrod, 1994).

A Resource Guide to Careers in Child and Family Policy (Gordon & Chase-Lansdale, 1995) [Careers in Child and Family Policy, Harris School, University of Chicago, 1155 East 60th Street, Chicago, IL 60637, 773-702-6654]

➢ For information about congressional committees and executive agencies of particular relevance to children's policy:

Handbook of Federal Agencies, Legislative Committees, Programs, and Private Foundations Interested in Adolescent Health (Carver, 1992).

A Resource Guide to Careers in Child and Family Policy (Gordon & Chase-Lansdale, 1995).

➢ For general information about federal and state governments:

Federal Yellow Book: Who's Who in Federal Departments and Agencies (Leadership Directories, Inc., published quarterly).

Congressional Yellow Book: Who's Who in Congress, Including Committees and Key Staff (Leadership Directories, Inc., published quarterly).

State Yellow Book: Who's Who in the Executive Branches of 50 State Governments (Leadership Directories, Inc., published quarterly).

➢ For information that can be located on the Internet. Listed below are World Wide Web sites that post specific job and internship opportunities in policy settings:

http://epn.org (The Electronic Policy Network provides links to various foundations, policy research centers, and advocacy organizations; the "Jobs" link on the EPN home pages lists job and internship information, and some individual settings post job opportunities on their web sites as well.)

http://qsilver.queensu.ca/~appanwww (The Association for Public Policy Analysis and Management includes a Job Bank of opportunities within think tanks, the government, and policy schools and institutes.)

http://www.usajobs.opm.gov (The Office of Personnel Management affords search-for-employment opportunities in the federal government, including students and summer positions.)

➢ To locate the web site of a particular setting of interest, try a web browser search of the Internet. See also the American Public Welfare Association's links to state human services agencies:

http://www.apwa.org/statenew/statenew.htm

and Policy Street's links to a range of think tanks, advocacy organizations, associations, government agencies, and academic settings:

http://www.policy.com

➢ For specific information about the federal government:

http://www.house.gov (United States House of Representatives)

http://www.senate.gov (United States Senate)

http://watson.policy.net (CapWeb World Wide Web site)

gopher.cqalert.com (Congressional Quarterly's gopher site)

➢ For a general introduction to policy aspects of cyberspace:

Washington Online (Maxwell, 1995).

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89

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A Reconceptualization of the Effects of Undernutrition on Children's Biological, Psychosocial, and Behavioral Development

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Task Force on Nutrition and Behavioral Development of the International Dietary Energy Consultative Group

Introduction

About 40%—approximately 190 million—of the world's children below 5 years of age are underweight (that is, weight-for-age two standard deviations below the medians of the National Center for Health Statistics of the United States [NCHS]/World Health Organization [WHO])[1] and may, according to international organizations such as WHO, be assumed to be suffering from or to have suffered from varying degrees of undernutrition (International Conference on Nutrition, 1992). The numbers are particularly high in southern Asia and are increasing in Africa, especially sub-Saharan Africa. Severe clinical undernutrition, much less common than mild-to-moderate undernutrition, affects up to 10% of preschool children, depending on the country surveyed.

Also in This Issue...

COMMENTARY

23 Nutrition: Essential Ingredient for Child Development
Johanna T. Dwyer

26 Nutrition, Cognitive Development, and Economic Progress
Judith McGuire and Donald Bundy

BRIEF

29 U.S. Nutrition Programs under Welfare Reform
Editor

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In many of these societies, chronic undernutrition during infancy and early childhood has significant adverse effects on subsequent cognitive development and school performance. Ultimately, a high prevalence of undernutrition stands to interfere with the formation of human capital, the cornerstone of social and economic development and welfare within a society.

In 1973 a subcommittee on Nutrition, Brain Development and Behavior of the Committee on International Nutrition Programs of the Food and Nutrition Board of the National Academy of Sciences (NAS) of the United States published a position paper on the relationship of nutrition to brain and cognitive development (NAS, 1973). This paper reported that although the fundamental mechanisms by which nutritional and environmental factors may affect the central nervous system were not known, three putative pathways for causal action were recognized:

(1) Structural and biochemical changes in the brain may alter brain function and reduce learning abilities.
(2) These factors may decrease exposure and responsiveness to environmental stimuli and thereby limit development.
(3) Changes in personality, emotionality, and behavior of the child may disrupt the learning process.

The authors added, however, that there was no evidence to claim that undernutrition "per se contributes more or less to the depressed cognitive development of previously malnourished children than do unfortunate social and environmental conditions" (1973, p. 4). Evidence did suggest, nevertheless, that severe undernutrition does impair intellectual development, above and beyond the effects of social influences. Since then, a number of reviews have been published by independent investigators who considered available evidence in the context of the mechanisms postulated by the NAS position paper (Barrett & Frank, 1987; Buzina et al., 1989; Levitsky, 1979; Lozoff, 1988; Pollitt, 1987, 1988; Pollitt & Thomson, 1977; Simeon & Grantham-McGregor, 1990). Overall these reviewers concurred that severe malnutrition in early life impairs cognitive function, but they considered the evidence on mild-to-moderate malnutrition insufficient for definitive conclusions.

New information on undernutrition has recently led to a reconceptualization of its effects on human development. Combined with results of new experiments using animal models (Almeida, Oliveira, & Graeff, 1991; Austin et al., 1992; Bedi, 1992; Diaz-Cintra, Cintra, Ortega, Kemper, & Morgane, 1990; Keller, Cuadra, Molina, & Orsingher, 1990; Medvedev & Babichenko, 1988), new evidence is emerging from a variety of studies in human populations:

(1) Clinical trials of dietary (Husaini et al., 1991) and iron (Lozoff, 1990) supplementation;
(2) Follow-up assessments of previously severely malnourished (Grantham-McGregor, Powell, Walker, Chang, & Fletcher, 1994) and supplemented (Pollitt, Gorman, Engle, Martorell, & Rivera, 1993) children;
(3) Studies of specific nutrients and contextual risk factors as predictors of functional competence at different ages (McCullough et al., 1990; Sigman, Neumann, Baksh, Bwibo, & McDonald, 1989; Wachs et al., 1995).

Whereas researchers previously focused on protein energy malnutrition (PEM) as a central causal agent, they have become increasingly aware that such an approach is limited because PEM is not a distinct clinical entity but a syndrome having multiple causes (Schürch, 1995). PEM coexists with micronutrient deficiencies and imbalances that can affect central nervous system (CNS) function and divert development from a normal trajectory (Golub, Keen, Gershwin, & Hendrickx, 1995; Pollitt, 1995). But the social environmental context also plays a key role.

Investigators have thus shifted away from measuring the contribution of undernutrition to cognitive deficits, per se, toward identifying and measuring the interactions and transactions among undernutrition and contextual factors that determine the final outcome of the undernourished child. Mild-to-moderate malnutrition is now recognized as indeed a developmental risk factor. Conjointly, stunted brain growth is considered too simple an explanation in light of recent evidence, so that other biological mediators, such as alterations in neuroreceptor sensitivity, are now being considered (Levitsky & Strupp, 1995; Strupp & Levitsky, 1995).

These new scientific developments led the International Dietary Energy Consultative Group (IDECG) to convene a task force[2] to assess current knowledge of the relationship between undernutrition and behavioral development in children and to interpret this information in the context of current theories of nutrition and developmental psychobiology. The Task Force, consisting of nutritionists, physiologists, physicians, and psychologists, presents in this report a review and interpretation of the main findings currently available on the effects of several types of undernutrition. Also included are new perspectives on undernutrition which point to a theoretical reconceptualization of the issues.

Reconceptualizing the Relationship of Nutrition and Development

The following section describes how the strategy for investigating the relationship between undernutrition and cognitive development has changed and is continuing to evolve. Also discussed are some of the problems in defining the nutritional and outcome variables of interest and how biological and environmental factors can modify the effects of undernutrition.

Assessing Nutrition

Protein and energy. In the 1960s, when researchers and policymakers were becoming increasingly concerned that early PEM could result in permanent impairment of intellectual development, it was widely accepted that protein was the limiting nutrient in the diet of populations at risk. During the next decade, however, dietary energy was held to be the more critical factor (McLaren, 1974). It was understood that to provide undernourished children with protein without also providing sufficient energy was futile, because the dietary protein would be used to supply energy rather than essential amino acids.

Iron, iodine, and zinc. Accompanying the new focus on energy was a recognition that, in most circumstances, energy deficiency may be closely linked to political and socioeconomic problems not easily addressed by simple nutritional intervention. Such political complexity and the fact that dietary energy is inextricably confounded with a mix of nutrients were two of numerous reasons that led subsequent research and policy interest to shift from the study of PEM effects to the effects of specific nutrients, especially Vitamin A, iron, iodine, and zinc. Whereas iron deficiency was known to be a cause of anemia, zinc deficiency a cause of growth retardation, and iodine deficiency a cause of goiter and cretinism, studies established further that deficiencies in these nutrients have broader systemic effects that lead to multiple threats to child health and development (United Nations ACC/SCN, 1993).

Complexities of deficiencies. Mild-to-moderate protein-energy malnutrition is difficult to diagnose, because it does not produce a specific set of symptoms and signs. It also coexists with other nutrient deficiencies. The same foods, particularly those from animal origin (from meat, fish, and poultry), are often sources of energy, protein, and distinct micronutrients (e.g., iron and zinc). Children

that do not have access to these foods are at risk of multiple nutritional deficiencies. Further, some constituents of a habitual diet can limit the absorption of some important nutrients. This is the case, for example, with phytates, tea, and coffee which inhibit the absorption of non-heminic iron. Dietary quality[2] is critically important, requiring diversity and, to the extent possible for a family, the inclusion of foods of animal origin.

Where food is scarce and dietary quality is poor, diets consist primarily of staples such as cereals and legumes. Such diets typically contain few animal products, fresh fruits, or vegetables, and are therefore associated with low intakes of certain vitamins and minerals, high intakes of phytates and fiber, and poor bioavailability[3] (Allen, 1993). Moreover, bioavailability is reduced when the supply of nutrients that enhance absorption is low. Finally, when food availability and quality are inadequate, the incidence of morbidity is usually high, with several nutrients simultaneously depleted through anorexia, malabsorption, and/or diarrhea with its associated inflammatory responses (Chen, 1983; Martorell & Yarbrough, 1983; Sahni & Chandra, 1983).

Thus, with both the nature of nutritional deficiency and the relationship among nutrients unclear, it remains a challenge not only to understand effects but to utilize findings in designing intervention strategies. In populations where general undernutrition is common, supplementation with a single nutrient, with the exception perhaps of iodine, will often be ineffective because as one deficiency is ameliorated, others may become limiting.

Measuring Outcome

Investigations of both the nature and range of effects of undernutrition on intellectual development have been limited by the restricted nature of the psychological tests commonly used to assess children's cognitive development. Availability and convenience of the test seem to have been the dominant criteria for test selection, rather than considered theory and well-defined hypotheses that would test the psychological processes most likely to be affected. Consequently, it is possible that deficits in specific cognitive functions, e.g., attention, have not been adequately assessed by IQ or achievement tests, and may have been underestimated or missed entirely (Diamond et al., 1992). This concern is borne out by suggestive evidence of impaired attentiveness in previously undernourished children (Galler, Ramsey, Solimano, & Lowell, 1983).

Effects of undernutrition on social and emotional development have been generally disregarded. The few researchers who have investigated such effects have observed that social and emotional development is sensitive to undernutrition (Barrett, 1984; Espinosa, Sigman, Neumann, Bwibo, & McDonald, 1992) and can moderate effects on other processes. Detriments in these domains, observed repeatedly in animal studies (Levitsky & Strupp, 1995), may well have significant effects on the child's ability to adapt to the educational and social environment.

The traditional approach of focusing exclusively on cognitive development, independent of other psychological processes and systems, contradicts both current understanding of psychological development and the results of experimental studies based on animal models. Such a restricted approach also gives the mistaken impression that the effects of undernutrition on cognition are direct. Current data indicate strong reciprocal interactions between cognitive and emotional development so that changes in one may contribute to changes in the other (Rothbart, Derryberry, & Posner, 1994; Steinmetz, 1994).

Incorporating the Context

Adopting a contextual approach acknowledges that we can not interpret the contribu-

tions of specific biological or psychosocial factors to development independent of the individual's specific environment. Within this framework, the study of nutritional influences on development must account for not just the biological but also the psychosocial stressors that accompany undernutrition (Horowitz, 1989; Pollitt, 1987; Ricciuti, 1981, 1993). Available evidence clearly demonstrates that undernourished individuals have a higher probability of simultaneous exposure to other risk factors (Golden, 1991; Grantham-McGregor, 1984; Pollitt, 1987), including

(1) *biological factors* (e.g., morbidity, parasitic infection, lead exposure);
(2) *psychosocial factors* (e.g., child neglect, poor-quality schools);
(3) *socioeconomic factors* (e.g., parental underemployment, lack of access to medical care).

Conversely, the detrimental impact of an adversity may be attenuated (though not necessarily eliminated) by *protective factors*, such as maternal education (Rutter, 1983; Zimmerman & Arunkumar, 1994). For example, in one study among impoverished rural communities in Guatemala, maternal education ensured that the children benefited from a nutrition program. Independent of the distance between home and the center where the foods were distributed, the mothers with higher levels of education took the children to the center to eat the food distributed without charge. This was not the case among children of mothers with low levels of education: these children were likely to be taken to the center only if they lived nearby (Carmichael, Pollitt, Gorman, & Martorell, 1994).

Traditionally, environmental influences have been regarded as complicating nuisances, to be controlled for by elements of the research design or statistical procedures. But this view has tended to oversimplify or obscure inherent complexities of causation that can only be captured if the most relevant biological, psychosocial, and socioeconomic factors (the covariates) are an integral part of the research plan (Lozoff, 1990).

Main Research Findings

The following is not intended to be a comprehensive review of the literature. Rather, it is restricted to what members of the Task Force held to be the main and strongest findings. More extensive reviews are provided in papers prepared by Task Force members and published in the *Journal of Nutrition Supplement*, "The Relationship between Undernutrition and Behavioral Development in Children," (volume 125, number 8S). This present review focuses first on data from observational and intervention studies of intrauterine growth retardation and PEM and then describes findings from intervention studies of micronutrient deficiencies.

Intrauterine Growth Retardation

Three strategies have been used to test the effects of mild-to-moderate prenatal undernutrition on behavioral and cognitive development:

(1) Assess the development of growth-retarded newborns.
(2) Follow children born into periods of famine.
(3) Track the effects of supplementing the diet of nutritionally at-risk mothers on the development of the offspring.

Development of growth-retarded newborns. This is a very heterogeneous group. Although social class is the strongest predictor of intrauterine growth retardation, other factors, including genetics, infection, placental damage, and maternal malnutrition, may also cause growth retardation (Kramer, 1987). This report focuses exclusively on those relatively few studies that investigate nutritional factors. In Guatemala, for example, one study found that birth weight below the 10th percentile of

the reference weight distribution for gestational age was associated with cognitive delays at 36 and 48 months (Gorman & Pollitt, 1992; Villar, Smeriglio, Martorell, Brown, & Klein, 1984), but birth weight was unrelated to cognitive test performance at 60 months and in adolescence (Pollitt, Gorman, & Metallinos-Katsaras, 1992).

Studies in more affluent countries suggest that the timing of malnutrition can moderate the outcome (Wachs, 1995). Comparatively poor postnatal performance deficits were more likely when prenatal stunting occurred before 24 weeks of gestation (Harvey, Princie, Burton, Parkison, & Campbell, 1982). But other social, educational, and biological factors can also moderate the effects of prenatal undernutrition. As noted by Wachs (1995), postnatal developmental risk is decreased among infants from socially and economically advantaged families (Vohr, Garcia-Coll, & Oh, 1989); they tend to have fewer postnatal biomedical complications (Eckerman, Sturm, & Gross, 1985) and are more likely to be exposed to programs of early cognitive stimulation (Padin-Rojas et al., 1991).

Children of famine. Children born to Dutch women whose second half of pregnancy coincided with the famine in the winter of 1944–45 had an average birth weight 327 grams below the norm. In early adulthood, however, they showed no deficits in intelligence (Stein, Susser, Saenger, & Marolla, 1975).

In Kenya, a period of drought and food shortage compromised further the energy intake of families among a nutritionally at-risk population. Besides showing weight loss, school children became less attentive in the classroom and reduced their motor activity in the playground. Toddlers were protected through family adjustments: Neither their energy intake nor their body weight was reduced; play and language behavior also remained stable (McDonald, Sigman, Espinosa, & Neumann, 1994).

Nutritional supplementation of mothers. Supplementation trials of pregnant women have yielded mixed findings. One study in Harlem, New York, found no effects of protein supplementation during pregnancy on the performance of offspring on developmental tests administered at 12 months of age, but the subjects did show beneficial effects on measures of habituation and play behavior (Rush, Stein, & Susser, 1980). A second study in Sui Lin Township, Taiwan, found sparse effects: infants at 8 months of age whose mothers had received a protein and energy supplement during pregnancy and lactation showed no effects on mental development and modest beneficial effects on motor development (Joos, Pollitt, Mueller, & Albright, 1983). At 5 years of age the children's performance on an IQ test showed no effects of the supplement (Hsueh & Meyer, 1981).

In summary, empirical evidence favoring the assumption that intrauterine growth retardation causes cognitive delays is weak. The number of relevant studies is small, and the data are not supportive, particularly in studies of middle childhood and adolescence. Further, a recent review of studies of children 7 years old and older, conducted in the United States and Europe, found little to support that intrauterine growth retardation is a risk factor for later development (Hack, 1996).

Concurrent and Later Effects of Undernutrition

Two sets of data are cited in this section: The first includes observational studies that tested the relationship between anthropometry (human body measurement) and dietary intake, on the one hand, and performance on mental and motor tests, on the other. In some of the studies the nutritional and outcome measures were concurrent; in others the anthropometric and dietary measures preceded the outcome measures. The second set of data comes from studies in which subjects' daily

dietary intake was controlled, amounting to a nutritional supplement.

Body size, diet, and development. Measurements of linear growth (i.e., recumbent length and height), body weight, and other anthropometric measurements (e.g., skin-fold thickness) are widely used in clinical work and nutrition epidemiology to classify the nutritional status of children from infancy to adolescence. Children whose growth is slow or arrested in populations where malnutrition is endemic are assumed to be or to have been undernourished. In this light it would seem reasonable to postulate that an association between poor physical growth (e.g., stunting) and slow mental development was explained primarily by nutritional factors. That is, if undernutrition explained children's physical growth retardation, and retardation was associated with slow mental development, then undernutrition must also explain delays in mental development. This interpretation is speculative, however: both physical growth in early and late childhood and cognitive development are influenced by many other factors besides nutrition.

Independent of prenatal nutritional history, chronic mild-to-moderate PEM during the first 2 years of life has frequently, but not always, been found related to concurrent delays of mental and motor development (Wachs, 1995). In one study of young children in Jamaica, stunting was associated with reduced motor activity and exploratory behavior (Simeon & Grantham-McGregor, 1990). Later, again in Jamaica, better-nourished children exhibited increases in exploratory behavior and social interaction (Meeks Gardner et al., 1993). A study in West Java, Indonesia, found an association between body length and delays in the acquisition of gross motor milestones leading to bipedal locomotion (Pollitt et al., 1994). Self-locomotion is presently considered a critical experience for normal cognitive development (Bertenthal & Campos, 1990).

While undernutrition of infants is a concern, undernutrition among preschoolers and school-age children is also a serious public health problem. Undernourished preschool children accustomed to diets that do not meet their physiological requirements are at risk for lower levels of attention, learning impairment, and poor school attendance and achievement (Simeon & Grantham-McGregor, 1990; Wachs, 1995). A study in Kenya, for example, found that, after taking demographic factors into account, energy and animal protein intakes during the preschool years were associated with play and cognitive performance at 5 years of age (Sigman, McDonald, Neumann, & Bwibo, 1991). Other evidence from school-age children indicated that body size, particularly height-for-age, was related to performance on cognitive and achievement tests (Wachs, 1995).

Anthropometric indicators of undernutrition during the first 3 years of life also predict cognitive test performance in later childhood and adolescence. In the same study in Kenya, body size in infancy predicted performance on cognitive tests administered at 5 years of age (Sigman, Neumann, Janson, & Bwibo, 1989). Rural Guatemalan subjects also showed an association between height at 3 years of age and performance on a battery of psycho-educational tests administered 15 years later (Martorell, Rivera, Kaplowitz, & Pollitt, 1992).

Regarding diet, studies in Egypt (Wachs et al., 1995) and Kenya (Sigman, Neumann, Baksh, et al., 1989) showed that among toddlers intake of energy and total protein were positively associated with level of symbolic play and mental competence. In the Kenyan study, animal protein intake, compared to total protein, assessed at 18 and 30 months of age, was the better predictor of cognitive test performance at 5 years of age (Sigman et al., 1991).

Cognitive test performance among school children was also related to the quantity and

quality of the diet. For example, the total energy and protein intakes of school-age children in Kenya were positively related to cognitive development (Sigman, Neumann, Janson, et al., 1989). However, in Kenya, as in Egypt, the intake of a better-quality protein (from animal sources) was a better predictor of performance in this age group (Wachs et al., 1993).

Protein and energy malnutrition. Laboratory animals which are severely undernourished early in life show a wide range of changes in responsiveness to environmental contingencies (Strupp & Levitsky, 1995). The most pervasive and permanent changes appear to be in emotionality, motivation, and anxiety level, which in turn affect all aspects of behavior, including those indicative of cognitive status. Affective changes that seem to be associated with changes in neural receptor functions and lowered cognitive flexibility persist after rehabilitation (Strupp & Levitsky, 1995).

Severely undernourished children are apathetic, not very responsive to their environment and inclined to stay close to their mother (Grantham-McGregor, 1995). Some of these behavioral characteristics persist into early childhood. For example, in a study in Barbados school-age children who were severely undernourished as infants were characterized as quiet, withdrawn, and passive (Galler et al., 1983). Severe undernutrition in early childhood was also associated with later cognitive deficits and poor school achievement in a study of children in Jamaica (Grantham-McGregor, 1995), particularly for children who continue to live under conditions that are not supportive of their growth and development. The early placement of such children in environments where they receive good nutrition, psychosocial support, and education can substantially reduce or even eliminate cognitive deficits (Colombo, de la Parra, & Lopez, 1992; Grantham-McGregor, Powell, Walker, & Himes, 1991; Winick, Meyer, & Harris, 1975).

Supplementary feeding. A meta-analysis of experimental and quasi-experimental studies showed that supplementary feeding during pregnancy and the child's first months of postnatal life enhanced motor development among infants (8 to 12 months) and toddlers (12 to 24 months) and also mental development among toddlers (Pollitt & Oh, 1994). In a study in Mexico early supplementary feeding influenced the quality of the mother's caregiving behavior (Chavez & Martinez, 1984). A relationship between the child's diet and maternal behavior was also observed in a study in Egypt, even after statistically controlling for the adequacy of the mother's own dietary intake (Wachs et al., 1992). These findings illustrate the influence that nutrition has on the reciprocal relationship between parent and child—the parent's caregiving practices influencing infant development and the infant's behaviors influencing parent's caregiving practices.

Supplementary feeding during the first 2 years of life has also been found to have long-term effects on cognitive development. In rural Guatemala, nutritional supplementation of pregnant and lactating women and their offspring for at least the first 2 years of postnatal life improved the later performance, in adolescence, on tests of reading, vocabulary, arithmetic, and general knowledge. Effects were strongest among children whose families were at the low end of the social and economic distribution within their rural communities (Pollitt et al., 1993).

Evidence suggests further that supplementary feeding beyond the period of peak growth of the central nervous system has long-term effects on cognitive development. In the Guatemalan study, supplementary feeding *after* the first 2 years of life also led to improved performance, in adolescence, on tests of arithmetic, general knowledge, and reading (Pollitt et al., 1993). In one intervention in Cali, Colombia, which began at 42 months of age or later and combined nutritional supplementation (protein, energy, and vitamins A and B plus iron) with health support and educational stimulation, undernourished preschool children

showed improved cognitive test performance. At the beginning of primary school, however, when the intervention was discontinued, the amount of benefit children showed varied, depending on the timing and duration of support: the earlier the intervention was begun and the longer it lasted, the greater the benefit (McKay, Sinisterra, McKay, Gomez, & Lloreda, 1978).

Theoretically, school nutrition should enhance children's achievement by improving attendance, preventing hunger, and correcting nutritional deficiencies. Evaluations of school nutritional programs have yielded equivocal results overall; however, in those with stronger research designs (i.e., in Jamaica, Peru, and the United States) the expected effects were observed (Jacoby, Cueto, & Pollitt, 1996; Meyers, Sampson, Weitzman, Rogers, & Kayne, 1989; Pollitt, Jacoby, & Cueto, 1996; Powell, Grantham-McGregor, & Elaston, 1983).

Contextual Factors

Assuring the best prediction of an undernourished child's later development requires that we account for not only the nutritional risk but also the context in which malnourishment occurred (Wachs, 1995). Undernutrition, with few exceptions, is closely associated with economic impoverishment, limited educational opportunity, limited access to health care, poor hygiene and sanitation, and continuous exposure to vectors of infection (Mata, 1978). But even where such conditions prevail, those families that are socially and economically better off are less likely to house an undernourished child (Espinosa et al., 1992; Grantham-McGregor, 1984; Kirksey et al., 1991; Wachs et al., 1995). Contextual conditions also explain, by themselves or through their interaction with malnutrition, part of the retarded physical growth and the delays in motor, mental, and socio-emotional development of undernourished infants and children. Further, in more affluent countries, young children who are undernourished owing to medical reasons are generally free of any cognitive deficits (Pollitt, 1987).

An interaction between socioeconomic background and early supplementary feeding was observed in Guatemala. As noted earlier, the effectiveness of an early energy and protein supplement on later performance in adolescence was greatest for those children who were at the lowest end of the social and economic distribution (Pollitt et al., 1993). The supplement appeared to compensate for low status.

In summary, nutritional indicators (e.g., anthropometry and dietary intake) among infants and preschool children are positively related to performance on tests of mental and motor development. Anthropometry (particularly height-for-age) also relates to school-age children's performance on cognitive and psycho-educational tests. Supplementary feeding during pregnancy and during the first 2 years of postnatal life enhances the development of nutritionally at-risk children and improves cognitive competence as measured 10 years later. Some of these benefits result even if the intervention started after the peak period of central nervous system growth. Nutritional factors, however, do not fully explain delays in development or the comparatively poor test performance of undernourished children. Contextual factors, rooted in poverty, must be invoked. Assessing the combination of these factors and nutritional risk yields the best prediction of the development of these children.

Micronutrient Deficiencies

As noted earlier, some micronutrient deficiencies that coexist with protein and energy deficiency have adverse effects on behavior in laboratory animals, on mental and motor development of infants and toddlers, and on the cognitive functioning of older children. It is important that we not overlook the role of micronutrient deficiencies in studies of the effects of undernourishment on child develop-

ment. In some investigations such deficiencies are a confound; in others they can be conceptualized as an effect modifier. In the first instance, the dietary intake of children in populations previously considered at risk of PEM were likely to have been deficient in vitamins and minerals, *not* in energy and protein, thus confounding results (Allen, 1993; Beaton, Calloway, & Murphy, 1992). In the second, nutritional factors that cause PEM could also be causing micronutrient deficiencies (e.g., in iron and zinc) that are known to affect, in turn, mental and motor development in children (Golub et al., 1995; Pollitt, 1995); thus, the outcomes may vary, depending on the presence or absence and severity of deficiencies.

Iron. Infants and toddlers who are iron-deficient anemic consistently perform less well on tests of mental and motor development than their peers whose body iron stores are replete (Lozoff, 1990; Walter, 1989). Yet supplementary iron has not generally reversed the developmental delay in this age group, except in a randomized trial in West Java, Indonesia (Idjradinata & Pollitt, 1993). In other studies, the developmental reversal was restricted to those cases where the iron supplementation resulted in normalizing the child's hemoglobin level. A preventative trial with the same age group yielded equivocal findings. The motor, but not mental, development of infants fed iron-fortified formulas was accelerated, compared to controls, up to 12 months of age; but this advantage was lost at 15 months (Moffatt, Longstaffe, Besant, & Dureski, 1994).

Evidence on the effects of iron deficiency on preschoolers and older school-age children is clearer. Compared to controls, children with iron deficiency scored lower on cognitive tests and performed less well on school tests (Pollitt, Hathirat, Kotchabharkdi, Missell, & Valyasevi, 1989; Seshadri & Gopaldas, 1989). Iron supplementation led to significantly improved performance on measures of overall intelligence and on tests of specific cognitive processes among iron-deficient children (Seshadri & Gopaldas, 1989; Soemantri, Pollitt, & Kim, 1985; Soewondo, Husaini, & Pollitt, 1989).

Research has yet to determine the role of iron in the brain in the cognitive and emotional detriments observed in iron-deficient children. It has been proposed that such effects are mediated by a deficiency in the functional activity of dopamine receptors (Yehuda & Youdim, 1989), but this hypothesis has yet to be fully tested in humans (Dallman, 1990). Alternatively, the impact of iron on cognitive performance may be mediated by changes in motivation or emotion that interfere with attentional processes which, in turn, interfere with cognitive performance. This question—how changes in iron status translate into changes in cognitive and noncognitive performance—remains an important area for future research.

Iodine. Maternal iodine deficiency in early pregnancy and associated thyroxine deficiency impair the development of the fetal central nervous system and can result in frank, irreversible cretinism in the child. Studies in Ecuador (Fierro-Benitez et al., 1989; Trowbridge, 1972) showed that correction of the maternal iodine deficiency before conception or in early pregnancy can improve the mental performance of offspring. Comparisons of primary school children in China, in areas with iodine deficiency versus areas with normal iodine intake (Ma, Wang, Wang, Chen, & Chi, 1989) and of goitrous vs. non-goitrous children in Chile (Muzzo, Levia, & Carrasco, 1987) showed better mental and psychomotor performance in the latter groups.

Two double-blind[4] intervention studies of primary school children yielded contradictory results. An intervention with goitrous Bolivian primary school children reduced the goiter rate but had no effect on physical or mental performance (Bautista, Barker, Dunn, Sanchez, & Kaiser, 1982), whereas iodized oil given to iodine-deficient children of similar age in Malawi did have a positive effect on mental

and certain psychomotor test performance (Shrestha, 1994).

Zinc. Severe developmental zinc deficiency in laboratory rats disrupted brain growth and morphology and led to long-term behavioral changes that were qualitatively similar in many respects to those produced by general undernutrition (Golub et al., 1995). However, since severe induced zinc deficiency produces anorexia, it is difficult to discriminate between the effects of low zinc intake and an overall decrease in nutrient intake. Studies of marginal and moderate zinc deficiency in young monkeys have demonstrated effects on activity level, exploration, and performance on some cognitive tasks (Golub, Gershwin, Hurley, & Saito, 1985). In stunted school-age children, however, no differences were found between groups varying in zinc status, or within groups in response to zinc supplements, in scores on standardized tests of attention (Gibson et al., 1989).

At present, no experimental studies have discriminated among the effects of deficiencies of zinc, iron, protein, and energy. Thus, how different deficiencies may interact is unknown.

Future Directions

New understanding of the role of nutrition in child development points to suggestions for future research.

Biological and Behavioral Mechanisms

Research efforts are gradually revealing a finer-grained picture of the processes linking nutrition and observable behavior. Various mechanisms involving both biological and behavioral aspects of development are implicated and bear investigating.

Biological. Earlier research linking PEM and behavior suggested that undernutrition interfered with the development of the central nervous system. Undernutrition reduced brain weight and the number of brain cells, which in turn were seen as the cause of irreversible detriments in cognitive and motor performance (NAS, 1973). This emphasis on brain growth focused attention almost exclusively on the period of maximal brain growth, seen as the period of greatest vulnerability.

New findings indicate, however, that periods before and after that of maximal brain growth may be equally important. It is now understood that critical aspects of central nervous system development—for example, gliogenesis, macroneurogenesis, and early glial and neuronal migrations—precede the period of maximal brain growth. Other later processes, such as synaptogenesis and myelinization, may also be sensitive to insult and remediation (Levitsky & Strupp, 1995; Strupp & Levitsky, 1995).

Research during the last decade has shown that the effects of undernutrition late in gestation are similar to those occurring early. In the case of previously undernourished animals, for instance, the period of brain growth can be extended, and remarkable recovery has been observed. Such evidence is leading researchers to consider a broader range of possible biological mediators, including brain differentiation and changes in neuroreceptor sensitivity. For example, perturbations at the subcellular level, as suggested by alterations in sensitivity to pharmacological challenges, persist after periods of early undernutrition and nutritional rehabilitation (Levitsky & Strupp, 1995).

Behavioral. In the mid 1970s the concept of *functional isolation*, referring to restricted interaction with the environment, was proposed to explain the long-term behavioral effects of early undernutrition (Levitsky, 1979; Levitsky & Barnes, 1972). It was hypothesized that it is the differential experience of the organism rather than disrupted brain growth that mediates the effects of early undernutrition over time. The child who is undernourished attempts to maintain energy balance by reducing energy expenditure and withdrawing

from environment stimulation. Such withdrawal limits the child's capacity to take in environmental information and thereby acquire the skills and knowledge necessary for normal behavioral development (Levitsky & Strupp, 1984). This concept arose from evidence suggesting that the behaviors affected by early undernutrition were similar to those produced by early environmental isolation.

Although the functional isolation hypothesis was initially developed as an alternative to a purely biological explanation of nutrition-mediated behavioral deficits, the two explanations may in fact be compatible rather than conflicting. Functional isolation may actually influence both central nervous system and behavioral development. While not all aspects of the CNS may be sensitive to environmental influences, and the extent of effects may be relatively small (Bedi & Bhide, 1988), evidence from behavioral neuroscience studies illustrates how restricting experience may adversely influence development (Diamond, 1988; Greenough & Black, 1992) and efficiency (Stone, 1987) of specific brain structures and processes. In addition to the influence of functional isolation on both brain and behavior, subsequent neural changes may further accentuate the effects of functional isolation on ultimate development.

Recently, the functional isolation proposition has been elaborated to explain in greater detail some of the mechanisms that may contribute to long-term adverse effects of undernutrition on cognitive development (Pollitt et al., 1993). This revised proposal hinges on the well-documented effects of undernutrition on body size, neuromotor development, and physical activity. If the child is small and physically underdeveloped and inactive, he or she may

(1) induce behaviors and social responses from caretakers that would generally be reserved for younger children;
(2) undertake less exploration of the environment; and
(3) consequently lag in acquiring the motor skills, cognitive abilities, and social behaviors that typify normal development.

These patterns can operate independently and interactively, with cumulative effects, such that the child ultimately falls behind in competencies attained by well-nourished children. Investigating how nutrition promotes individual differences in children's motor skills, exploration, and play behavior would provide a welcome test of this hypothesis.

Assessing Nutrition

Focusing on individual nutrient deficiencies is particularly problematic within populations in which undernutrition is a major public health concern. With the possible exception of populations where this is not a problem, studies of single nutrients are no longer adequate (Golub et al., 1995; Pollitt, 1995)—as indicated by the coexistence of multiple nutrient deficiencies (Schürch, 1995), complex interactions in the absorption and utilization of nutrients, and the demonstrated effects of different nutrients on CNS function. Moreover, failure to account for the relationship between PEM and micronutrient deficiencies has led to inconclusive findings regarding the causal role of distinct nutrients on cognitive outcomes (Pollitt et al., 1993).

Too often studies are marred by a lack of information on the overall nutritional status of the population in question. For example, studies testing the functional consequences of particular nutritional deficits (e.g., energy) have floundered, because the prevalence of the deficit in the populations under study was negligible (Allen, 1993). It is important, therefore, to obtain survey data on nutritional indicators before implementing field studies. Further, if limits in knowledge and technology preclude the use of laboratory measures to determine nutrient status (as in the case of zinc), then alternative procedures (e.g., response to treat-

ment) should be used to establish baseline values. While this approach could be costly, the yield to science would be rewarding.

Measuring Outcome

Just as the field is moving beyond an emphasis on single nutrients, so the focus on cognitive development to the exclusion of biological and psychosocial development no longer suffices in the investigation of undernutrition effects. Research is expanding to encompass the broader context and the multiple risks that interact with nutrition in determining outcomes for the undernourished child.

Assessments of affective characteristics, e.g., temperament, reactivity to stress, self-regulation, and emotional regulation, stand to shed light on the effects of undernutrition on the behavioral adjustment and psychological functioning of undernourished children. Although such attributes are typically treated as innate, increasing knowledge of the CNS processes that underlie individual differences in temperament and link temperament and cognitive processes makes research in this domain promising. One issue is whether the nutritional environment could modify the genotype of temperament.

Likewise, studying the effects of undernutrition on the simultaneous or sequential relationships between developmental systems is also critical. The link, for example, between neuromotor and cognitive delays in the undernourished infant merits attention in light of new information showing that self-locomotion is an antecedent to perceptual development (Bertenthal & Campos, 1990; Lockman & Thelen, 1993).

We must understand more about the neural mechanisms through which undernutrition and related factors translate into individual differences in behavior and development. Recent advances in biomedical methodology promise a more direct assessment of critical nutrition-sensitive CNS processes. For example, nuclear magnetic resonance spectroscopy allows noninvasive assessment of changes in CNS energy metabolism (Holtzman, McFarland, Jacobs, Offut, & Neuringer, 1991) and has been used with some success to distinguish the CNS metabolic concentrations of at-risk and normal infants (Cady et al., 1983).

Finally, the possible effects of undernutrition across generations must be identified. At issue is how biological and behavioral mechanisms may contribute to the transfer of a burden of undernutrition from one generation to the next (Susser & Stein, 1994). Several longitudinal studies of severe and mild-to-moderate undernutrition in early life, launched in the past, offer unique opportunities for the follow-up of new generations.

Accounting for Factors That Modify Effects

Studies are needed of the effects of undernutrition over the lifespan, from the earliest stages, including the prenatal, to old age. But, while age may be related to the outcome, we must identify what factors related to increasing age act to modify outcomes. Obviously, effects are not necessarily mediated only by changes in the CNS occurring during the specific period of maximal brain growth (Levitsky & Strupp, 1995). How, for instance, is the educational achievement and progress of children hampered by undernutrition (Soemantri et al., 1985)? Or how does formal education limit the adverse effects of early undernutrition?

Future studies should also attend to the role of intra-individual and environmental factors that protect against or accentuate the risks of undernutrition. Research designs that would, for example, track the chain of relationships—of effects of undernutrition on the child's behavior, the child's behavior on caregiver behavior and vice versa, and possible buffering or deleterious factors on these relationships—would go a long way toward clari-

fying how undernutrition affects behavioral outcomes and development.

Finally, what is needed are studies that capture the broader context, the "human condition." Undernutrition among children in economically impoverished populations is likely compounded by multiple risk factors—by conditions besides undernutrition. With few exceptions (Chavez & Martinez, 1984), the recognition that such interactions do exist has failed to lead to studies that attempt to disentangle them or that seek to identify the factors that either increase or decrease the risks. It is, for example, important to understand why, in one study, poor, undernourished children experienced significant developmental delays, while middle-class children who suffered from severe undernutrition secondary to medical problems showed no such effects (Pollitt, 1987).

Conclusion

In summary, there is convincing evidence that general undernutritionand iodine and iron deficiency can impair behavioral and cognitive development. Iodine deficiency has its maximal effect in utero, while that of iron deficiency and general undernutrition is greatest in the early postnatal period. These effects, however, are no longer believed to be limited to the phase of maximal brain growth or to be mediated exclusively through neuroanatomical structural changes. Studies intended to show or reverse the effects of PEM do not allow a clear causal attribution to protein or energy as determining factors, and confounding with iron remains a possibility. Other single nutrients could have effects on behavioral development, but this has not yet been convincingly demonstrated in humans. The incidence and magnitude of nutritional effects on behavior can be greatly exacerbated by other risk factors and insults; they can also be reduced or eliminated by buffering factors. Such effect modifiers should be considered in all research and policy discussions.

While we encourage further research on the effects of undernutrition on human development, there is, finally, a great need to study the societal impact of undernutrition in populations in which most members are affected. Of great concern are populations which have been exposed to natural and man-made famine conditions. Such research would involve calculating the social and economic cost of limiting the potential of human capital within a society and estimating the benefits that would accrue through the prevention of malnutrition.

Notes

[1]Anthropometric (human body) measurements are generally used around the world to classify children as well-nourished or nutritionally at risk (i.e., stunted or wasted). The World Health Organization (WHO) has a set of reference standards for weight and height used to compare trends among different countries and to estimate the prevalence of undernutrition. The 50th percentile, that is, the median of the normal distribution of a particular anthropometric measurement (e.g., weight) at a given age, is generally used as the criterion for comparisons. The WHO references are based on the respective anthropometric measurements obtained by the United States National Center for Health Statistics (NCHS). Although weight-for-age is a criterion often used to classify children at-risk, it is recognized that this measure is not a fully satisfactory criterion because the weights of some children, which may be low for their chronological age according to the WHO reference, may be in line with their short stature.

[2]Dietary quality refers to a diverse diet that includes protein and micronutrients (e.g., iron) of animal origin.

[3]In this context, bioavailability indicates that absorption of nutrients varies depending

on their source. For the human infant, for example, the iron contained in human milk has a higher bioavailability than that in cow's milk. This difference explains in part why the prevalence of iron-deficiency anemia is much lower among infants who are breast fed, compared to those fed cow's milk.

*In a double-blind experiment, neither the subject nor the person who implements the treatment nor the person who analyzes the data knows which subjects make up the experimental group and which the comparison group.

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COMMENTARY

Nutrition: Essential Ingredient for Child Development

Johanna T. Dwyer

New Views on Nutrition's Role in Child Development

The report of the Task Force on Nutrition and Behavioral Development in this issue provides a welcome update of evidence on the importance of nutrition as one essential ingredient in child behavioral development.

The children of the poor in developing countries are most at risk of undernutrition. Protein calorie malnutrition still exacts a heavy toll. It contributes to over half of all deaths of young children in developing countries, largely by worsening the vulnerability to or effects of certain infectious diseases (Pelletier, 1994). Protein calorie malnutrition was originally thought of as a protein deficiency. It is now known to be due primarily to shortages of food energy, often accompanied by disease and micronutrient deficiencies. Its effects involve both physical and behavioral development over the short and long term.

Nearly 1,000 million persons, many of whom are children and nearly all in developing countries, suffer from dietary deficiencies of iodine, vitamin A, or iron, and another 1,000 million are at risk of these deficiencies (World Bank, 1996). In contrast, these deficiencies, with the possible exception of iron, are more rare in highly industrialized countries such as the U.S. Child undernutrition today usually involves multiple nutrient deficiencies, and other environmental stresses. Child nutritional status is the outcome of the interplay of biological, social, and economic factors at both the national and family level (UNICEF, 1991). Infectious diseases, lead and other environmental toxicants, child neglect, poor schooling, and poverty all interact and increase its ultimate ill effects. These environmental and social contextual factors must be recognized and dealt with to craft effective interventions.

The effects of undernutrition are also multiple. These can involve not only illness but cognitive deficits, neuromuscular delay, and alterations in affective processes.

Undernutrition and dietary deficiencies also occur in affluent countries. A few examples suffice. Half of neural tube defects may be due to poor folic acid nutritional status of mothers during the organogenesis of the fetus (Committee on Genetics, 1993; Zimmerman & Shane, 1993). Many poor pregnant women and children living in deteriorated housing still have blood lead levels that increase risks to children of compromised behavioral development (Agency for Toxic Substances and Disease Registry, 1988; Brody et al., 1994; Pirkle et al., 1994). New evidence suggests that poor nutrition and health in a pregnant woman may put the fetus at increased risk for certain chronic degenerative diseases, including coronary artery disease and hypertension (Barker, 1992,1994).

Implications for Crafting Effective Nutrition Interventions

The Task Force's findings and other recent developments provide the scientific basis for devising effective ways and means to alleviate the adverse effects of undernutrition on child development.

Integrated programs. Dr. Abraham Horwitz, director emeritus of the Pan-American

Health Organization/World Health Organization, argues that the three essential conditions for good nutrition are food, health, and care. With respect to food and health, new technologies are now available that help to prevent and control many prevalent infectious diseases and deficiencies of iodine, iron, and vitamin A that affect children under 5 years of age (WHO/UNICEF, in press). Care includes prenatal care, continuing with prolonged breast-feeding, proper supplementary feeding, and the fostering of the growth and development of children through timely access to health services and a healthy environment. Prevention and treatment of child undernutrition require not only food and health measures but also emotional support, stimulation, and education and help for caregivers (Brown & Sherman, 1995). Therefore, programs designed to alleviate undernutrition must be broad based, well integrated, and well administered. They require nutrition, health, behavioral science, and organization and management expertise (Horwitz, 1996).

Interdisciplinary involvement. Dr. Nevin Scrimshaw, winner of the World Food Prize, believes that most ill health and premature death in children are preventable if poor diet and other adverse environmental and lifestyle factors can be minimized. To make this new preventively based paradigm a reality Scrimshaw calls for a "multidisciplinary effort in which the role of the social scientist is as important as that of the health scientist in promoting health; both have more to offer in the effort than those exclusively concerned with curative medicine" (Scrimshaw, 1996. p. 67). The promotion of breast-feeding and improvement of household food security to provide adequate child access to food are only two of many areas that benefit from the inputs of social scientists.

Broader measures of success. Nutritional objectives need to be more fully incorporated into the policies and programs that affect children's development. Needed are broader measures of success that include the potentiating effects of nutrition interventions on development and health improvement. And findings must be communicated more effectively to policymakers. Social and behavioral scientists can help by conducting hypothesis-driven research employing better, broader, and more valid measures of the factors that may give rise to effects on development. More extensive measures of health outcomes should also be employed. Alleviating vitamin A deficiency in developing countries, for example, has multiple effects—including decreases in nutritional blindness, fewer complications from infectious diseases such as measles and acute diarrhea, and a nearly 25% decrease in mortality among children under 5 years of age (Beaton, 1993).

Political will. Technology alone is not enough; political will and administrative skill are also needed. For example, protein calorie malnutrition has political and socioeconomic causes that are not simply due to food shortage. Its prevention involves devoting more care and resources to socioeconomically deprived and nutritionally vulnerable groups in the population and thus is politically complex. Similarly, the control of iodine deficiency disease depends as much on political will and the availability of an infrastructure that can sustain iodination efforts as it does on technical expertise, and the same can also be said for most dietary deficiency diseases (Hetzel & Pandav, 1996; Mamar & Dunn, 1995).

Conclusion

The challenges that remain are to design politically acceptable, cost-effective intervention programs that reach children at risk with food, health, and care. They must be well funded, sustainable, and flexible enough to continue even as economic and social circumstances change. Experts in child development are essential to this effort. The payoffs include not only better physical health for children but more global enhancements to child and national development.

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COMMENTARY

Nutrition, Cognitive Development, and Economic Progress

Judith McGuire and Donald Bundy

In the mid-to-late 1970s, there was a flurry of research on the interrelationship between nutrition and cognitive development. These early results, much of which are cited in the Task Force report, strengthened the argument that malnutrition was, in turn, a critical limiter of economic development in developing countries. This conclusion generated greater political commitment and action to address malnutrition. In the 1980s developing countries initiated an unprecedented number of large nutrition programs, with support from bilateral and multilateral donors. The Task Force review strengthens yet again the case for the importance of nutrition; it is hoped that continuing increases in national programs will result.

The community of developmental research has yet to fully document, however, the effects of nutrition programs (and there were many) on cognitive development, school performance, or, ultimately, labor productivity. Although economists, through analyses of national data, have repeatedly shown that child nutrition affects both the fostering and utilizing of education (Glewwe, Jacoby, & King, 1996), and that child nutrition and schooling jointly determine adult income (Thomas & Strauss, 1992), the explicit link between nutrition programs in childhood and later income is yet to be specified.

Since 1990, a new wave of political interest in the nutrition–cognitive development link has focused largely on the effects of micronutrients (especially iodine and iron). The calculation of millions of IQ points lost to iodine deficiency, while of perhaps dubious academic validity, has moved several countries to iodize their salt. This calculation was facilitated by a meta-analysis of 17 studies on the effect of iodine deficiency on IQ (Bleichrodt & Born, 1994). Recent work on iron is also helping developmentalists and practitioners make convincing arguments about the need to address anemia, the most prevalent and neglected nutrition problem in the world (Partnership for Child Development, 1997).

Evidence from research, however, is not enough to make public policy. The Task Force report not only summarizes the justification for addressing malnutrition but also gives the reader a better idea about *how* to intervene and *when* and *with whom*.

Early Child Development Program (ECD). On the "how" question, the report presents a number of options. First is the Early Child Development program which includes food, psychosocial stimulation, attention to preventing health problems, and child care. Several successful experiences with ECD show that such programs can be effective and have long-term impacts. But although the general ingredients of successful interventions are known, many countries may not be able to afford such comprehensive programs, particularly for the poor, without significant contributions of volunteer labor.

Supplementary feeding. A second option is supplementary feeding, which is not universally appropriate. The Task Force report clarifies that supplementary nutrition without complementary psychosocial stimulation may not result in significant improvement in cognitive or educational outcomes. Moreover, and not mentioned in the report, supplementary feeding without accompanying nutrition education and health referral does not even alleviate more immediate malnutrition effects; it is often very costly, difficult to target, and conducive to dependency

(World Bank, 1991). One of the few documented benefits is that some nutrition programs have, without any other intervention, caused parents to focus more attention on the child and provide greater stimulation (Chavez & Martinez, 1981).

Whereas most types of supplementary feeding are unhelpful, nutrition interventions in schools show great potential, yet have been widely abused. Unfortunately, too often this approach becomes part of a political game, a public relations gimmick which is mistargeted, expensive (offering high-status, nutritionally unnecessary, often imported commodities, like milk), and poorly designed (e.g., giving children a lunch just before they go home instead of a mid-morning snack or breakfast which might benefit in-school learning [Del Rosso & Marek, 1996]).

Specific therapies. A third option is to use specific therapies for specific conditions. New data suggest that anthelmintics can help correct growth retardation and excessive iron losses due to intestinal parasites. Deworming school children is highly cost-effective and reduces community-wide transmission (Awasthi & Peto, 1996).

Micronutrient supplementation is another successful intervention delivered in schools, health centers, and through the private sector. Vitamin A capsules have eliminated vitamin A blindness from Indonesia, for instance. Iron-folnate supplements offer much promise for infants, school children, and pregnant women, even in the absence of other nutritional or health interventions.

Modifying behavior. A final "how-to" option is to modify childrearing behaviors and nutritional practices. The Task Force report focuses on behavior rather than on brain science, which leads to some important conclusions. First, a child's behavior problems are much more visible and understandable to the mother, the health professional, and the policymaker than, for example, disrupted neuronal myelination. Second, child behavior is a product not just of inborn personality but also of caregiving behaviors and physical inputs (food). Thus the problem is not medical, to be treated by a doctor, but rather social and economic, requiring multifaceted attention. Third, although behavior is the problem, it is also the solution. Mothers' behaviors—breast-feeding and other feeding practices, affective behavior, and general caretaking—are as critical to resolving the problem as food per se. Changing the caregiver's practices (e.g., by tying suggestions for change to the child's growth) is a highly cost-effective way to improve nutrition; it also has the benefit of engaging the mother, and other caretakers, in more intensive care of the child.

Targeting intervention. With respect to the "when" and "with whom," two schools of thought are reflected in the report: "the sooner the better" and "it's never too late." Probably both statements are true. Clearly children and pregnant women are the highest priority targets for general nutrition programs. Where malnutrition causes irreversible damage—e.g., cretinism due to iodine deficiency, blindness due to vitamin A deficiency, or intrauterine grown retardation—the timing of the intervention is critical to prevent this damage. With some other kinds of malnutrition the human body is quite resilient, but effects of malnutrition are cumulative. In these cases, although intervening early is desirable, it is still justified after the most vulnerable period to compensate for earlier deprivation and to facilitate catch-up growth.

Vulnerability to adverse and costly consequences of malnutrition continues throughout life. Thus, policymakers must be astute in identifying the target group and when to intervene. In the case of iron deficiency or short-term hunger, for example, the well-documented effects on learning and their coincidence with an age when children are in school argues for intervention at school-age. Other instances of malnutrition may call for different solutions.

Summary

The Task Force's report makes a compelling argument that to neglect the problem of malnutrition invites serious consequences to individual development and a heavy toll on the development of human and social capital. It is useful to have this message repeated. Even though researchers may not have the definitive answers—as to how, when, and with whom to intervene—governments, donors, and community activists are already taking action. Donor agencies, like the World Bank, are initiating and supporting integrated early childhood development programs, school-based nutrition and health programs, and nutrition education programs. To quantify the consequences of failing to address malnutrition is the next research challenge; it is vital that the dialogue between researchers and policymakers continues so that research informs policy decisions and program needs inform research.

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BRIEF

U.S. Nutrition Programs under Welfare Reform

Editor

As Johanna Dwyer points out in her commentary (p. 23), the multiple nutrient deficiencies typical of undernutrition tend to be rarer in industrialized countries like the U.S. We enjoy both greater affluence overall and protections against severe deprivations. In FY 1996, for example, the Food Stamp program served 25.5 million participants, including 13 million children, at a cost of $24.4 billion. The National School Lunch Program provided free and reduced-rate meals to 14 million low-income school children at a cost of $3.8 billion. The Summer Food Service Program served 2.1 million children at a cost of $246 million. And WIC (the Special Supplemental Food Program for Women, Infants, and Children), with a budget of $3.7 billion, supported supplements and nutrition education for 7.2 million pregnant and postpartum women and their infants and children.

Nutrition programs are being cut back, however, under the new welfare reform law, P.L. 104-193, the Personal Responsibility and Work Opportunity Reconciliation Act of 1996. Although states, under the new law, are assuming authority over many entitlement programs, the federal government remains custodian of both the Food Stamp and child nutrition programs.

A variety of program changes are slated to save c. $30 billion over the period FY 96-2002, according to the Congressional Budget Office; $27 billion is to come from Food Stamps, $3 billion from child nutrition programs—to include the School Lunch, School Breakfast, and Summer Food Service programs.

Food Stamps. Various measures aimed at curtailing Food Stamp eligibility are aimed at reducing the number of benefit recipients, thus leading to savings. Hardest hit will be childless adults and current and future legal aliens who will no longer be eligible to receive Food Stamps or other benefits, beginning in spring 1997. Other changes affecting children will limit eligibility further. As part of child support enforcement, for example, noncustodial parents who fail to maintain payments will lose eligibility. Parents who have particularly high shelter costs will no longer be able to deduct these from the accounting of their income.

Child nutrition programs. The most significant changes to child nutrition programs include (1) a two-tiered reimbursement approach to child and adult day care food programs to better target low-income recipients, (2) cutbacks in reimbursements to the Summer Food Service, and (3) elimination of any School Breakfast expansion. The noncitizen provisions of the law give states the option to deny WIC and some child nutrition (not School Lunch or Breakfast) and commodity benefits to illegal aliens.

Clinton budget. The picture is further complicated by President Clinton's stated intent to revisit welfare reform legislation in the present congressional session. The Clinton administration's budget, issued early in February, increases the number of months unemployed adults can receive Food Stamps from 3 out of 36 to 6 out of 12 months and provides an important protection, that a recipient cannot be denied the benefit unless he or she refuses to take a job. The proposal also eases the shelter cap by raising the allowed deduction and removing the cap altogether in 2002. Although such adjustments would improve the prospects for families and children, upcoming negotiations seeking a balanced budget promise to pressure for further cuts, not increased spending.

Monitoring. What all this will mean for the nutrition status of the nation's children and families remains to be seen. Nonprofits and nongovernmental entities will continue to evaluate effects, and some government-sponsored monitoring is in place. The U.S. Department of Agriculture, through its Continuing Survey of Food Intakes by Individuals, tracks household food-buying and consumption patterns. And the Bureau of the Census, in collaboration with the Food and Consumer Service, added, in April 1995, questions to its Current Population Survey aimed at assessing the prevalence and severity of food insecurity in the U.S. (Center for Nutrition Policy and Promotion, 1996). The results of this effort, expected to become available in 1997, are the first in a planned annual series that will support the monitoring of changes over time.

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